DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT

TECHCITY EAST CAMPUS
TOWN OF ULSTER
ULSTER COUNTY, NY

VOLUME II – APPENDICES A-H

LEAD AGENCY:	**TOWN OF ULSTER TOWN BOARD** **ONE TOWN HALL DRIVE** **LAKE KATRINE, NY 12449**
CONTACT PERSON:	**HON. JAMES E. QUIGLEY 3RD, SUPERVISOR**
SEQRA CLASSIFICATION:	**TYPE 1 ACTION**
APPLICANT:	**TECHCITY PROPERTIES, INC.** **300 ENTERPRISE DRIVE** **KINGSTON, NY 12401**
AGENCY ACCEPTANCE DATE:	
PUBLIC HEARING DATE:	
END OF PUBLIC COMMENT:	

LAST EDIT DATE: 11/3/10

APPENDICES

APPENDIX A
REDEVELOPMENT OVERLAY DISTRICT

Shuster Associates, Inc.
July 1, 2009
Revised September 20, 2009
Revised June 21, 2010
Revised June 24, 2010
Revised September 21, 2010

DRAFT ZONING LEGISLATION

TOWN OF ULSTER

REDEVELOPMENT OVERLAY DISTRICT (ROD)

BE IT ENACTED by the Town Board of the Town of Ulster as follows:

1. Section 190-6 of Chapter 190 of the Town of Ulster Code entitled "Districts Established" is hereby amended to add the following new zoning district designation:

ROD Redevelopment Overlay District

2. Section 190-7: The Zoning Map of the Town of Ulster, incorporated in this chapter by reference, is hereby amended to designate the following parcels, _____, as ROD Redevelopment Overlay District.

3. Chapter 190 of the Town of Ulster Code is hereby amended to add the following Section 190-12.2 to Article V entitled Use and Bulk Requirements:

§190-12.2 ROD Redevelopment Overlay District

In the ROD, Redevelopment Overlay District, the following regulations shall apply:

A. <u>District Intent and General Purpose</u>

(1) The Town Board recognizes that certain office, manufacturing and related facilities within the Town, which are no longer utilized by their original owners or for their original purposes, can constitute a valuable economic resource for the Town, but may require changes in use, configuration or development program to be sustainable.

(2) Through the review and approval of a redevelopment plan for a previously developed, large-scale site in the OM District, the Town Board can encourage the adaptive reuse of such a site that will generate a positive tax base, provide employment opportunities, enhance the image of the property and act to further the policies and objectives set forth in the Town of Ulster Comprehensive Plan.

(3) Due to the size and existing layout of such sites, flexible land use patterns, shared parking strategies and design criteria may replace the standard lot and bulk requirements, yard requirements and setbacks (excepting height) of the OM District while insuring appropriate accessibility to public roads and open space.

(4) By the establishment of appropriate conditions following the completion of the environmental review process, the Town Board can create an approval structure for individual site plan and subdivision proposals that will comprise the redevelopment of such a site.

(5) The ROD is an overlay district intended to provide an alternative to redevelopment of the site under the existing underlying OM zoning district. The standards and procedures set forth in this Section are intended to over-ride and replace standards and procedures set forth elsewhere in this chapter unless such standards and procedures are specifically referenced or incorporated herein.

B. Applicability

The provisions of the ROD shall be applicable to single or contiguous sites under the same ownership or control in the OM District, as delineated on the Zoning Map of the Town of Ulster. Such site(s) must contain at least 100 acres and include existing buildings with an aggregate floor area of at least 500,000 square feet and be serviced by a municipal sewer and water..

C. Permitted Uses and Subdivisions

Uses Permitted by Right: A site subject to the provisions of the ROD may be arranged, designed or used, only for the following purposes, by right, subject to site plan approval and any conditions established, by such approval. Uses otherwise permitted in the OM District are not permitted in the ROD unless specifically set forth below:

(1) Research facilities, manufacturing and related uses including warehousing

(2) Professional and business offices and services

(3) Retail and personal service establishments

(4) Restaurants and drinking establishments

(5) Hotels and conference centers

(6) Health clubs and indoor recreation facilities

(7) Schools and institutions of higher education

(8) Customary accessory uses to other permitted uses.

(9) Residential uses subject to the following:

(a) Such uses shall only be located on the second or third floor of buildings which contain retail, office or other permitted non-residential uses on the first (ground level) floor.

(b) Each dwelling unit shall have no more than two bedrooms. A one bedroom unit shall contain no less than 700 square feet of interior floor area and a two bedroom unit no less than 850 square feet.

(c) No dwelling unit shall be located on the same floor as or the floor below any non-residential use.

(10) Home occupations subject to the provisions of §190-14.A

(10) Utility Facilities and Structures (cell tower, solar panels, co-gen).

(11) Parking facilities and structures

Subdivisions: The ROD site may be subdivided upon approval by the Planning Board, in accordance with Chapter 161, for the purposes set forth below. Any parcels created by such subdivision shall be subject to compliance with all provisions of this section and the approved Comprehensive Design Plan. (See Section F. below)

(1) Subdivision, re-subdivision or lot line revisions to create individual parcels for permitted uses, parks and/or open space.

(2) Subdivision to create blocks or sections for future development which may be further subdivided for the purposes set forth in item (1) above.

D. Application for Designation of a Redevelopment Overlay District

(1) Any owner of property, or the owner's designated representative, within the OM District which complies with Section B above may apply to the Town Board for use of the Redevelopment Overlay District provisions in lieu of the use, bulk, parking, floor area ratio and related standards in the underlying OM District. Such application shall be in accord with the standards and procedures set forth herein and shall be referred to the Town Planning Board for review and recommendations prior to final action by the Town Board.

(2) Each application for designation of a ROD shall be accompanied by the following:

(a) A written analysis of the project's eligibility for the establishment of a ROD including site area and existing floor area.

(b) A location map showing the parcels requested to be included in the ROD. The map will overlay the proposed parcels on the most recent air photos of that site and illustrate the site context by including the entire area within 500 feet of the site perimeter.

(c) A map showing the existing conditions on the proposed parcels including existing buildings, utilities, roads, easements, public access points, drainage, topography, all known environmental factors including soils, wetlands, endangered species, historic and archeological sites, etc. To the extent available this information shall be provided for all parcels shown on the location map.

(d) A written overview of the proposed project including a discussion of the disposition of existing buildings, proposed mix of uses on the site, compatibility of the proposed uses with each other and the general design philosophy for the site.

(e) A general Comprehensive Design Plan, which sets forth the overall area, location and height of proposed buildings, the likely mix of uses, the location of proposed access points and an overview of the location and hierarchy of the internal transportation circulation system, overall demarcation of open space and buffer areas, general approach to stormwater management, landscaping and lighting. The Comprehensive Design Plan shall present proposed design objectives and standards in both text and graphics.

E. Criteria for Approval of a Redevelopment Overlay District

In determining whether or not to approve establishment of a ROD district, the Town Board shall consider the extent to which, the application and supporting documents satisfy the following standards and criteria.

(1) Conforms to the applicable purposes and objectives of the Town's Zoning Law.

(2) Conforms to the applicable goals, policies and recommendations of the Town's adopted Comprehensive Plan.

(3) Conforms to the intent and specific purposes of this section.

(4) Satisfies the site area and total building floor area criteria set forth in Section B above.

(5) Demonstrates the provision of adequate public services, including emergency services and access to public transportation.

(6) Demonstrates the ability to provide adequate utilities including water supply, sewage disposal and storm water management.

(7) Establishes an architectural style of proposed buildings, including exterior design themes , and scale that is consistent with the intent and purposes of this Section.

(8) The Comprehensive Design Plan shall establish a feasible program for redevelopment of the site, and shall consist of the following:

[1] A master site redevelopment plan which may be prepared at a conceptual level but, at a minimum, must specify the number and type of uses proposed for development and depict their location as well as depict the parking areas to service the proposed uses and the means of traffic circulation, both automotive and pedestrian, between and among the uses.

[2] The Comprehensive Design Plan need not encompass all the details required for site plan approval pursuant to Chapter 145 but shall set forth in reasonable detail the anticipated locations and sizes of all major improvements such that the Planning Board can evaluate the plan for environmental, traffic and other impacts on the Town with a view toward attaching site plan related conditions of approval which must be met at the time a detailed site plan is submitted for approval for all or any portion of the site.

[3] The Comprehensive Design Plan shall include a phasing plan with estimated time periods for each phase and for completion of the entire development.

The Town Board shall consider the Comprehensive Design Plan developed in accordance with the procedures set forth herein in determining whether or not to approve establishment of a ROD District. The ROD District approval shall constitute the approval of the Comprehensive Design Plan as a guide for the development and approval of site plans in the ROD District. The Town Board in approving the ROD District shall consider the recommendation of the Town Planning Board. The process for the development of a Comprehensive Design Plan shall be an iterative process between the applicant and the Town Board utilizing the criteria to be considered by the Town Board in

approving the plan as well as those factors applicable to the Planning Board under Chapter 145.

F. Processing of Application. An application for approval of a ROD shall be processed in accordance with the following procedure:

(1) Submission. An application for approval shall be submitted to the Town Board in accord with the timing and procedures set forth below.

(2) Escrow Account. Upon submission of an application, the Town Board shall require the applicant to establish an escrow account in an amount deemed sufficient to reimburse it for reasonable fees incurred by planning, engineering, legal and other consultants in connection with their review of the application. The escrow account shall be periodically replenished as necessary. The applicant shall be provided with an ongoing, detailed description of the work performed and an accounting of all disbursements from the escrow. Upon termination of the review of the application,, any remaining funds in the escrow account shall be reimbursed to the applicant. Any disputes regarding the Town's use of the applicant's escrow funds or the fees charged by the Town's consultants in reviewing the application shall be referred to the Town Supervisor for resolution. The Supervisor shall resolve any such dispute within 30 days after receiving it and provide a report of his findings.

(3) Public Hearing. The Town Board shall conduct a public hearing on an application for approval of a ROD, which shall be held at the time and place prescribed by the Board. Notice and conduct of any public hearing shall be in accordance with New York State Town Law. Whenever possible, the Board shall combine public hearings required under this section with other public hearings required by other federal, state and local laws.

(4) Referral as per General Municipal Law. If required, the Town Board shall refer a full statement of the application to the Ulster County Planning Board as provided for by §239-m of the New York State General Municipal Law.

(5) Decision. The Town Board shall approve, approve with conditions or deny a request for establishment of a ROD following either:

[1] a SEQRA determination of non-significance, or

[2] the issuance of a SEQRA Statement of Findings, or

[3] a determination that the proposed action is consistent with a previously issued SEQR Statement of Findings.

The Board's decision shall contain specific findings demonstrating the application's compliance with the criteria for approval set forth in Section E above and may include any reasonable conditions to assure conformance with the intent and objectives of this section.

(6) Filing. The decision of the Town Board shall be filed in the office of the Town Clerk within five business days after such decision is rendered and a copy thereof mailed to the applicant.

G. Time Limits.

(1) An initial application for site plan approval of the entire site, or a section thereof, shall be submitted within two years of the establishment of the ROD. Failure to submit an application for site plan approval within that period shall render the Comprehensive Design Plan approved with the ROD null and void and of no force and effect.

(2) Construction work must commence within three (3) years from the latest date of any final site plan approval or other required permit or approval by involved agencies. If construction does not commence within said period, then the site plan approval shall become null and void and all rights shall cease.

(3) The Comprehensive Design Plan must be completed within the timeframe proposed by the applicant in its application at the time of approval. If the Plan is not completed within said time period or an amended time period then the approval of the Comprehensive Design Plan shall become null and void and all rights therein shall cease.

(4) For purposes of the above provisions the term "construction work" or "construction" shall mean disturbance of the project site and continued activity to install utilities, roads or other infrastructure or the process of erecting or rehabilitating any structure in accordance with the final approved site plan. The term "final site plan approval" shall mean the signing of the site plan by the Planning Board Chairman with an endorsement by stamp or other writing indicating that the plan has received "final site plan approval" and indicating the date of such final approval.

(5) Upon written request by the applicant**,** any of the time limits prescribed above may be extended by the Planning Board for good cause. Among the examples of good cause are delays occasioned by lawsuits, poor market conditions, credit market freezes, unforeseen site conditions and force majeure. The Planning Board shall not withhold such extension unless it finds that the applicant is not proceeding with due diligence or is otherwise violating the conditions upon which the approval was granted.

Extensions shall not exceed three years unless the applicant submits a written request for further extension.

(6) Within the time limits prescribed above, and for any extension period granted by the Planning Board, the Comprehensive Design Plan shall be deemed to have obtained vested rights for purposes of completing the approved development improvements notwithstanding any changes to the Zoning Law.

H. Conflicts.

(1) To the extent any provision of this law, including any provision of the approved Comprehensive Design Plan conflicts with any provision of any other Article in this Chapter, the provisions of this law shall control.

(2) The Town Board hereby declares its legislative intent to supersede any provision of any local law, rule, or regulation or provision of the law inconsistent with this local law. The provisions of law intended to be superseded include all the Town Law and any other provision of law that the Town may supersede pursuant to the Municipal Home Rule Law and the Constitution of the State of New York. The courts are directed to take notice of this legislative intent and apply it in the event the Town has failed to specify any provision of law that may require supercession. The Town Board hereby declares that it would have enacted this local law and superseded such inconsistent provision had it been apparent.

I. DEFINITIONS

The definitions contained in Section 190-4 of this Chapter shall apply to this section. In addition, as used in this section, the following definitions shall apply.

(to be inserted as required)
Comprehensive Design Plan
Master Site Development Plan
Phasing Plan

4. SEVERABILITY

If any clause, sentence, paragraph, section, article or part of this Local Law shall be adjudicated in any court of competent jurisdiction to be invalid, such judgment shall not affect, impair or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, section, article or part thereof

directly involved in the controversy in which such judgment shall have been rendered, and such invalidity shall not be deemed to affect the remaining portions thereof.

5. EFFECT OF AMENDMENT

Except as herein modified, Chapter 190 of the Laws of the Town of Ulster, originally adopted as Local law No. 9 of the year 1991 and any subsequent valid amendments thereto, are hereby ratified and confirmed.

6. EFFECTIVE DATE

This Local Law shall be effective on the date of filing with the New York Secretary of State.

APPENDIX B
INTERESTED AND INVOLVED AGENCY LIST

Involved And Interested Agencies And Required Permits And Approvals

The following permits and approvals will be required to achieve the initial actions described above or for subsequent site-specific actions to implement the development program.

1. Involved Agencies

a. Town of Ulster Town Board

- Establishment of Redevelopment Overlay District (ROD) and amendment of Zoning Map
- Approval of specific site plans

b. Town of Ulster Planning Board

- Approval of subdivisions

c. New York State Department of Environmental Conservation

- SPDES Permit
- Phase 1 RCRA Permit Modification

d. Ulster County Department of Public Works

- Highway access approval

2. Interested Agencies

Other agencies that will not grant permits or approvals but have an interest in the project include:

a. Town of Ulster

(1) Building Department
(2) Sewer Department
(3) Water Department
(4) Ulster Hose Company #5

b. Ulster County

(1) Planning Department

c. State, Regional Agencies and Local Agencies

(1) New York State Department of Transportation
(2) Hudson River Valley Greenway
(3) City of Kingston Water Department

APPENDIX C
SEQRA DOCUMENTATION
FINAL SCOPE
FULL EAF PART 1 & 2

SCOPING DOCUMENT
April 16, 2009

For Preparation of a Generic Draft Environmental Impact Statement
Under the New York State Environmental Quality Review Act (SEQRA)

TECH CITY COMPREHENSIVE DEVELOPMENT PLAN
(Proposed Mixed-Use Development on the former IBM Manufacturing Site)
Town of Ulster, Ulster County, New York

Date Scope Adopted by SEQRA Lead Agency: April 16, 2009

Date Scope Adopted by NEPA Lead Agency: _____

Name of Project:	Tech City Master Plan
Project Location:	300 Enterprise Drive Town of Ulster, Ulster County, New York
SEQRA Classification:	Type 1
Lead Agency:	Town of Ulster Town Board
Lead Agency Contacts:	Nicky B. Woerner, Town Supervisor Town of Ulster Town Hall 1 Town Hall Drive Lake Katrine, New York 12449
Applicant:	Tech City Properties, Inc. 300 Enterprise Drive Kingston, New York 12401

DESCRIPTION OF THE PROJECT

The Proposed Action consists of an amendment to the Town Code to add a procedure for Town Board review and approval of a "Comprehensive Development Plan" ("CDP") for certain properties located within the Town OM Zoning District. A CDP will provide a framework for the planned redevelopment over a period of years. The Proposed Action also includes the review and approval of a Comprehensive Development Plan for the redevelopment of the East Campus of Tech City (the former IBM manufacturing property) located in the Town of Ulster, New York.

The entire Tech City property is approximately 258 acres, with the lands to the west of Enterprise Road totaling approximately 120 acres ("West Campus), and the lands to the east of Enterprise Road totaling approximately 138 acres ("East Campus"). The Proposed Action contemplates the redevelopment of only the East Campus for this Generic Draft Environmental Impact Statement ("DEIS"). The East Campus is currently improved with 20 industrial and office buildings totaling approximately 2.16 million square feet, and approximately 4,200 at-grade parking spaces. The project for which the OM District – Comprehensive Development Plan is sought is a planned, integrated, multi-use development to include light assembly, office, research and development, educational, wellness, neighborhood retail, entertainment and multi-family residential uses, along with accessory parking.

The project is proposed to include the demolition of approximately 290,000 square feet of obsolete buildings, the reuse of 558,000 square feet of two existing buildings for interior parking facilities, the continued use of 1,318,000 square feet of existing buildings, and the introduction of approximately 645,000 square feet of new buildings. Approximately 3,875 parking spaces will be located throughout the East Campus, both in covered facilities and at-grade parking lots.

Vehicular access to the center would continue to be provided from the north and west by Enterprise Drive Exit of Route 199/209 and from the east and south by Boices Lane and Morton Boulevard, incorporating the existing roadway systems surrounding the East Campus. The project also contemplates re-opening the existing driveway connection on the north side of the East Campus to Old Neighborhood Road.

POTENTIAL SIGNIFICANT ADVERSE IMPACTS

Potential significant adverse impacts may relate to vehicular traffic, and the extent of construction impacts on the environmental remediation of ground water contamination.

GENERAL GUIDELINES

"Scoping" means the process by which the Lead Agency identifies the potentially significant adverse impacts related to the Proposed Action that are to be addressed in the Generic Draft Environmental Impact Statement, including the content and level of detail of the analysis, the range of alternatives, the mitigation measures needed and the identification of non-relevant issues. The primary goals of scoping are to focus the generic DEIS on potentially significant adverse impacts and to eliminate consideration of those impacts that are irrelevant or non-significant. This generic DEIS will address all components of the Proposed Action including, but not limited to, the information needed to evaluate the various permits and approvals required to implement the Proposed Action.

The generic DEIS for the Tech City Comprehensive Development Plan shall cover all items in this Scoping Document. Each impact issue (e.g., traffic, utilities, land use and zoning, etc.) can be presented in a separate subsection which includes: (1) a discussion of existing conditions;

(2) potential significant impacts associated with the Proposed Action; and (3) measures designed to mitigate the identified impacts.

All discussions of mitigation measures shall consider at least those measures listed in this Scoping Document and shall clearly indicate which measures have been incorporated into the project plans. When no mitigation is needed, the generic DEIS shall so indicate. Any assumptions incorporated into assessments of impact shall be clearly identified.

Narrative discussions should be accompanied by appropriate tables, charts, graphs, and figures whenever possible. If a particular subject can be most effectively described in graphic format, the narrative discussion should merely summarize and highlight the information presented graphically. All plans and maps showing the site should include adjacent homes, other neighboring uses and structures, roads, and water bodies. The preferred Comprehensive Development Plan and the No Action Alternative should be provided at a scale of 1 inch = 200 feet. Maps at the same scale should be provided as part of the document that shows the existing characteristics of the property.

Information should be presented in a manner which can be readily understood by the public. The use of technical jargon should be avoided. When practical, impacts should be described in terms which the lay person can readily understand.

All discussions of mitigation measures should consider at least those measures mentioned in the Scoping Outline. Where reasonable and necessary, they should be incorporated into the proposed action if they are not already included. For any mitigation measures listed in this Scope Outline that are not incorporated into the Proposed Action, the reason why the Applicant considers them unnecessary should be discussed in the DGEIS

The document should be written in the third person (i.e., the terms "we" and "our" should not be used). The Applicant's conclusions and opinions, if given, should be identified as those of "the Applicant".

Any assumptions incorporated into assessments of impact should be clearly identified. In such cases, the "likely worst case" scenario analysis should also be identified and discussed.

The entire document should be checked carefully to ensure consistency with respect to the to the information presented in the various sections.

INTRODUCTORY MATERIAL

The generic DEIS should be prepared to comply with the requirements of 6 NYCRR Part 617, State Environmental Quality Review. The introductory material at the beginning of the generic DEIS should include:

- Cover Sheet stating:

  A. Type of document (Generic Draft Environmental Impact Statement).
  B. Date submitted and any revision dates.
  C. Name and location of the project.
  D. Lead Agency for the project.

     Name, address and telephone number of the following person at the Lead Agency to be contacted for further information:

Nicky B. Woerner, Town Supervisor
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

E. Name and address of the project sponsor, and name and telephone number of a contact person representing the sponsor.

F. Name and address of the primary preparer(s) of the generic DEIS, and name and telephone number of a contact person representing the preparer.
G. Date of acceptance of the generic DEIS (to be inserted later).
H. Date by which comments are to be submitted to the Lead Agency (to be inserted later).

- List of Consultants: Names, addresses and project responsibilities of all consultants who have contributed to the preparation of the generic DEIS.

- Table of Contents including:
  A. Chapter and section headings with page numbers
  B. List of figures
  C. List of tables
  D. List of appendices
  E. List of additional volumes of the GDEIS (if any)

GENERIC DRAFT ENVIRONMENTAL IMPACT STATEMENT

I. GENERIC DEIS SUMMARY

The generic DEIS (GDEIS) shall include a summary that will provide the reader with a clear and cogent understanding of the information found elsewhere in the main body of the document. The summary shall only include information found elsewhere in the main body of the GDEIS. The summary shall include:

A. Brief description of proposed action.

B. Description of required permits and approvals and list of Involved Agencies.

C. Brief listing of anticipated significant impacts and proposed mitigation measures for each impact issue discussed in the GDEIS. The presentation format shall be simple and concise.

D. Brief description of reasonable alternatives to the proposed action or to specific elements of the action. A table, comparing each alternative relative to the various impact issues, should be included.

E. Brief description of development thresholds for the Proposed Action.

II. DESCRIPTION OF PROPOSED ACTION

A. Background
   1. Previous Use of the Site – including the site's environmental history.

2. Current Use of the Site – including office, commercial, industrial uses and description of the ongoing environmental investigations, studies and anticipated remediation of the ground water contamination being undertaken in collaboration with NYSDEC, IBM and the current property owner.
3. Existing Site Plan and Subdivision - including future resubdivision
4. Comprehensive Plan Recommendations
5. Description of easements and private agreements that affect the future development and use of the site.

B. Site Location and Description

1. Provide written and graphical description of geographic boundaries of the project, including, acreage, tax identification numbers and list of abutting properties. Map the geographical boundaries of the project on local and regional scale maps. The site shall be described relative to surrounding land uses, zoning designations and other key features such as Enterprise Drive, Boices Lane, CSX rail line and other prominent natural and man-made features on and within 500 feet of the project site.
2. Provide a detailed description of the previous and existing use of the site with respect to the environmental setting of the site and the natural resources identified. Include use, number, size, height, operation and condition of existing on-site structures.
3. General description of the existing infrastructure serving the project site, including a map of surrounding areas within 500 feet of the site boundaries. Existing water supply and sewage disposal systems, site access, road networks, and storm sewers shall be mapped.
4. Description of access to site from Enterprise Drive and Boices Lane and immediately adjacent County and Town roadways including but not limited to Old Neighborhood Road.
5. Identify existing zoning (OM-Office Manufacturing) and proposed zoning (OM-Comprehensive Development Plan (CDP) of site including density calculations, allowed uses and constraints.
6. An identification of the dimensions of the property through an existing conditions metes & bounds survey prepared by a licensed land surveyor, including any easements, rights-of-way, covenants & restrictions or agreements of record affecting the subject property. The survey will also delineate any special district boundaries and will include a calculation of the amount of restricted areas on the site, such as the acreage of easements, all regulated freshwater wetlands (i.e. State protected, Federal Jurisdictional), open space and recreation areas, streams, floodplains, and slopes equal to or greater than 15 percent.
7. List abutting landowners, their mailing addresses and corresponding tax parcel numbers.

C. Description of the Proposed Action
1. Proposed Zoning Amendment
   a. Amendment to OM District to provide Comp. Dev. Plan for certain properties
   b. Summary of CDP provisions and procedures
2. Proposed Comprehensive Development Plan for Tech City site
   a. Color Illustrative Site Plan - Campus Master Plan
   b. Proposed future re-subdivision plan - Sketch Parcel Layout]
   c. Site Access and Traffic Circulation

(1) External roads: Enterprise, Boices, Route 199/209, 9W, John Clark, etc.
(2) Internal roads: Roads A, B, C, D & E.
(3) All existing and proposed entrances: Enterprise, Boices & Old Neighborhood.
(4) Vehicular, truck, movements, delivery locations
(5) On-street parking plan.
(6) Trail networks, pedestrian or bicycle connections (including sidewalks) within the site and to off-site locations.
(7) Public transportation

d. Site Design
(1) Reuse of areas previously occupied by buildings and parking
(2) Areas of new site disturbance
(3) Layout of buildings
- Campus Master Plan

e. Existing and Proposed Buildings
(1) Location and arrangement
(2) Proposed uses/reuse – include maximum occupancy under use scenario
(3) Proposed demolition
(4) Proposed buildings
- Conceptual site plan and general building design guidelines

f. Existing and Proposed Parking
g. Existing and Proposed Landscaping and Lighting Concept
h. Existing and Proposed Stormwater Management
(1) Existing SPDES permits (if any)

i. Utilities
(1) Water – discuss available capacity of municipal system
(2) Wastewater – discuss available capacity of municipal system and on-site sewage treatment plant
j. Off-site Improvements, if any
k. Construction plan – include expected year of completion, phasing plan and construction phases such as demolition.

D. Purpose, Need and Benefits of the Proposed Action
1. Project Sponsor
2. Purpose of the Proposed Action
3. Need for the Proposed Action. Identify public need for the project and municipal objectives based on adopted community development plans.
4. Benefits of the Proposed Action. Discuss types of industries/businesses that are likely to be attracted, job creation and other economic development objectives in relation to local and regional goals.

E. Permits and Approvals (Involved Agencies)

Town of Ulster Town Board
Attn: Nicky B. Woerner, Supervisor
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449
- Zoning Amendment - OM-CDP
- Approval of CDP for Tech City

Town of Ulster Planning Board
Attn: Gerard Beichert, Chairman
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449
- Subdivision - (to be determined)

New York State DEC
Attn: James Tierney, Assist. Comm.
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

- SPDES Permit
- Phase I RECRA Permit Modification
- Air Resources Permit
- Petroleum and/or Bulk Storage Permit

Ulster County DPW
Attn: David Sheeley, Commissioner
Public Works Administration
315 Shamrock Lane
Kingston, NY 12401

- Highway Access Approval

F. Involved and Interested Agencies

See attached list

III. EXISTING ENVIRONMENTAL CONDITIONS, POTENTIAL IMPACTS, POTENTIAL MITIGATION MEASURES

For each of the different environmental issues listed below, the generic DEIS shall include a discussion of the existing conditions, the future conditions should the project not be constructed, potential significant impacts related to the project, and potential mitigation measures.

A. LAND USE AND ZONING
   1. Existing Conditions
      a. Area land use - including adjacent residential, office, retail/commercial, industrial and recreational uses
      b. Town Comprehensive Plan
      c. Zoning Ordinance
      d. Hudson River Valley Greenway
      e. Ulster County Land Use Plan
   2. Potential Impacts
      a. Introduction of Town Code amendment to provide for a Comprehensive Development Plan ("CDP") review process
      b. Introduction of a mix of land uses to a former single-user site and compatibility with surrounding uses
      c. Consistency with Comprehensive Plan
      d. Consistency with Zoning Ordinance
   3. Potential Mitigation Measures
      a. Establishment of development thresholds

B. LAND AND WATER RESOURCES
   1. Existing Conditions
      a. Environmental conditions
         (1) Discuss contamination on site
         (2) Discuss contamination impact to groundwater (plume) and subsurface soils
         (3) Discuss current remedial activities occurring on site
         (4) Discuss schedule for ongoing remedial activities
      b. Existing buildings and parking – including current percent cover of site.
      c. Existing open/green space

d. Existing soil conditions
e. Water resources
(1) Groundwater
(2) Existing stormwater conditions
(a) Existing watersheds
(b) Existing flood zones
(c) Existing on-site drainage, stormwater system and discharge point(s)
(d) Existing MS4

2. Potential Impacts
a. Environmental
(1) Discuss potential impact of construction/redevelopment activities to existing contaminated soil and/or groundwater
b. Demolition of existing buildings
(1) Removal of hazardous materials, if any
(2) Demolition of existing buildings
c. Earthwork
(1) Erosion and sedimentation
(2) Construction of new buildings and roadway
(a) Soil disturbance
(b) Installation of underground utilities
d. Water resources
(1) Groundwater conditions
(2) Proposed stormwater management
(3) Management of infiltration

3. Potential Mitigation Measures
a. Additional Environmental remediation, if applicable
b. Stormwater management plan – conformance with Phase II Stormwater regulations
c. Establishment of development thresholds

C. SOCIOECONOMICS

1. Existing Conditions
a. Employment characteristics
b. Fiscal conditions
2. Potential Impacts
a. Employment characteristics
b. Fiscal conditions
3. Potential Mitigation Measures
a. Establishment of development thresholds

D. COMMUNITY FACILITIES AND SERVICES

The community facilities and services analysis shall review the existing capacity and staffing levels of service providers and identify fiscal concerns that may be associated with potential project impacts. The analysis will consider the following:

1. Existing Conditions
a. Educational Services
b. Emergency Services (police, fire, EMS)
c. Public Works – including roads, water, sewer, sanitation facilities
d. Recreation and Open Space
2. Potential Impacts
a. Additional demand for educational services

b. Additional demand for Town emergency services
c. Additional demand for Town public works services - highway department, water department, sewer department
d. Impacts to existing open space

3. Potential Mitigation Measures
   a. Establishment of development thresholds
   b. Tax revenues

E. TRAFFIC AND TRANSPORTATION

1. Existing Conditions
   a. Surrounding Roadways - A description and traffic volume analysis of the following area roadways, at minimum, including pavement width/conditions, number of lanes, grades, parking, traffic controls and existing queuing and delays. The following intersections will be studied in detail. In addition, previous studies of Route 9W intersections will be reviewed and incorporated in the analysis:

      Boices Lane/John M. Clark Drive
      Boices Lane/Driveway Intersections - Tech City Site
      Boices Lane/Morton Blvd.
      Morton Blvd./Ulster Avenue
      Enterprise Drive/Boices Lane
      Enterprise Drive/NYS 199 Interchange
      Enterprise Drive/ Driveway Intersections - Tech City Site
      Old Neighborhood Road/John Clark Drive

   b. Graphically show all roadways in the immediate area of the site
   c. Mass Transit
   d. Pedestrian/bicycle
   e. Roadway geometry
   f. Signalization
   g. Railroad crossing
   h. Parking

2. Potential Impacts
   a. Increase in operational traffic
   b. Dedication of roadways to the Town
   c. Construction traffic
   d. Parking and parking garages
   e. Future development projects

3. Potential Mitigation Measures
   a. Off-site intersection/roadway improvements
   b. Establishment of development thresholds
   c. Roadway geometry
   d. Pedestrian linkages via sidewalks/bikeway
   e. Funding of improvements

F. UTILITIES

1. Existing Conditions
   a. Water Supply
   b. Sanitary Sewer – municipal sewer system and on-site sewer system
   c. Stormsewer

d. Electric and Gas
e. Telephone and Cable

2. Potential Impacts
   a. Increase in water demand
   b. Increase in sanitary sewer demand
3. Potential Mitigation Measures
   a. Establishment of development thresholds

G. AESTHETIC RESOURCES

1. A visual analysis will be prepared to evaluate the potential visual impacts of the project, including impacts from site and building lighting. The analysis will use existing condition photographs, an illustrative site plan, other graphic representations and narrative to describe:
   - The existing visual character
   - The change in visual character as a result of the proposed project
   - Mitigation measures proposed to minimize the impacts of the proposed project such as generic design guidelines and landscaping.

H. FISCAL IMPACTS

1. Existing Conditions
2. Potential Impacts
3. Potential Mitigation Measures

I. HISTORIC, ARCHEOLOGICAL & CULTURAL RESOURCES

1. A Phase 1A Archaeological Resource Survey will be completed to evaluate the potential for archaeological resources located on, and in the vicinity of, the site.
2. Potential Impacts
3. Potential Mitigation Measures

J. NOISE AND AIR QUALITY

1. Existing conditions will be described based upon existing air quality levels available from NYSDEC and EPA. Ambient noise levels in the vicinity of the project site will be described based upon publicly available data. A list the National and State Air Quality Standards for the project area will also be provided.
2. Project impacts using qualitative data
3. Proposed Mitigation

IV. ALTERNATIVES

A. No Action Alternative- Reoccupancy of existing East Campus Buildings totaling 2,164,000 sf less planned demolition of 288,000 sf of existing building space for a net useable floor area in all remaining buildings of 1,876,000 sf of floor space.
B. Modified Industrial Plan - Retain Building 1 and 3 for industrial building use and continue the south parking area as parking to support these buildings and reduce scale of the Town Center.
C. Expanded Mixed Use Town Center within southern portion of East Campus.

V. ADVERSE ENVIRONMENTAL IMPACTS THAT CANNOT BE AVOIDED

VI. GROWTH INDUCEMENT

A. Future growth potential.

B. Impact upon local roadways, future commercial and residential development.
C. Other.

VII. USE AND CONSERVATION OF ENERGY

A. The energy sources to be used if the proposed action is implemented.
B. Increased energy consumption.
C. Energy conservation measures.

VIII. IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

IX. SOURCES AND BIBLIOGRAPHY

X. APPENDICES

A. Interested and Involved Agencies List
B. SEQR Documentation
C. Correspondence
D. Technical Studies
    1. Traffic Study
    2. Stormwater Management Study
    3. Utility Analysis

APPENDIX
Interested and Involved Agencies List

1. Involved Agencies

Town of Ulster Town Board
Attn: Nicky B. Woerner, Supervisor
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

Town of Ulster Planning Board
Attn: Gerard Beichert, Chairman
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

New York State DEC
Attn: James Tierney, Assist. Comm.
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

Ulster County DPW
Attn: David Sheeley, Commissioner
Public Works Administration
315 Shamrock Lane
Kingston, NY 12401

2. Interested Agencies

Town of Ulster Sewer Department
Attn: Corey Halwick, Superintendent
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

Town of Ulster Water Department.
Attn: Paul Vogt, Superintendent
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

Town of Ulster Building Department
Attn: Stacey Ostrander, Clerk
Town of Ulster Town Hall
1 Town Hall Drive
Lake Katrine, New York 12449

Ulster County Planning Department
Attn: Dennis Doyle, Director
244 Fair Street
P.O. Box 1800
Kingston, New York 12402

NYSDOT
Attn: Mike Cotton, P.E.
Eleanor Roosevelt State Office Building
4 Burnett Boulevard
Poughkeepsie, New York 12603

Hudson River Valley Greenway
Attn: Kevin J. Plunkett, Chairman
Capitol Building
Capitol Station Room 254
Albany, New York 12224

City of Kingston Water Department
Attn: Judith Hanson, Superintendent
P.O. Box 1537
Kingston, New York 12402

Ulster Hose #5
Attn: Sam Appa, Chief
830 Ulster Avenue
Kingston, NY 12401

APPENDIX D
CORRESPONDENCE

APPENDIX E
SPDES DISCHARGE PERMIT FOR ULSTER WWTP

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

State Pollutant Discharge Elimination System (SPDES)
DISCHARGE PERMIT

Industrial Code: **4952**
Discharge Class (CL): **05**
Toxic Class (TX): **T**
Major Drainage Basin: **13**
Sub Drainage Basin: **07**
Water Index Number: **H-171**
Compact Area:

SPDES Number: **NY0021563**
DEC Number: **3-5154-00033/00002**
Effective Date (EDP): **10/1/2006**
Expiration Date (ExDP): **9/30/2011**
Modification Dates:(EDPM) **02/01/2010**

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act, as amended, (33 U.S.C. §1251 et.seq.)(hereinafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS

Name: **Town Of Ulster** Attention: **Nicky Woerner, Supervisor**
Street: **1 Town Hall Dr.**
City: **Lake Katrine** State: **NY** Zip Code: **12449**
is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS

Name: **Ulster Sewer District Sewage Treatment Plant**
Location (C,T,V): **Ulster (T)** County: **Ulster**
Facility Address: **1101 Dogwood St. Ext.**
City: **Kingston** State: **NY** Zip Code: **12401**
NYTM -E: NYTM - N:
From Outfall No.: **001** at Latitude: **41 ° 57 ' 55 "** & Longitude: **74 ° 00 ' 22 "**
into receiving waters known as: **Esopus Creek** Class: **B**
and; (list other Outfalls, Receiving Waters, & Water Classifications)

Outfall No.	Description	Latitude/Longitude	Receiving Stream/Class
002	Stormwater Sampling Point #1	41°57'55" / 74°00'15"	Esopus Creek via Municipal storm sewer / B
003	Stormwater Sampling Point #2	41°57'55" / 74°00'20"	Esopus Creek via Municipal storm sewer / B
004	Stormwater Sampling Point #3	41°57'56" / 74°00'23"	Esopus Creek via Municipal storm sewer / B

in accordance with: effluent limitations; monitoring and reporting requirements; other provisions and conditions set forth in this permit; and 6 NYCRR Part 750-1.2(a) and 750-2.

DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS

Mailing Name: **Ulster Sewer District**
Street: **1 Town Hall Dr.**
City: **Lake Katrine** State: **NY** Zip Code: **12449**
Responsible Official or Agent: **Corey Halwick, Superintendent** Phone: **(845) 336-6727**

This permit and the authorization to discharge shall expire on midnight of the expiration date shown above and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for permit renewal not less than 180 days prior to the expiration date shown above.

DISTRIBUTION:

C.O. BWP – Permit Coordinator
RPA/RWE
EPA Region II - Michelle Josilo
NYSEFC
Ulster Co DOH

Deputy Chief Permit Administrator: Stuart M. Fox

Address: Division of Environmental Permits
625 Broadway
Albany, NY 12233-1750

Signature: Stuart M. Fox Date: 1/7/10

PERMIT LIMITS, LEVELS AND MONITORING DEFINITIONS

OUTFALL	WASTEWATER TYPE	RECEIVING WATER	EFFECTIVE	EXPIRING
	This cell describes the type of wastewater authorized for discharge. Examples include process or sanitary wastewater, storm water, non-contact cooling water.	This cell lists classified waters of the state to which the listed outfall discharges.	The date this page starts in effect. (e.g. EDP or EDPM)	The date this page is no longer in effect. (e.g. ExDP)

PARAMETER	MINIMUM	MAXIMUM	UNITS	SAMPLE FREQ.	SAMPLE TYPE
e.g. pH, TRC, Temperature, D.O.	The minimum level that must be maintained at all instants in time.	The maximum level that may not be exceeded at any instant in time.	SU, °F, mg/l, etc.		

PARA-METER	EFFLUENT LIMIT	PRACTICAL QUANTITATION LIMIT (PQL)	ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE
	Limit types are defined below in Note 1. The effluent limit is developed based on the more stringent of technology-based standards, required under the Clean Water Act, or New York State water quality standards. The limit has been derived based on existing assumptions and rules. These assumptions include receiving water hardness, pH and temperature; rates of this and other discharges to the receiving stream; etc. If assumptions or rules change the limit may, after due process and modification of this permit, change.	For the purposes of compliance assessment, the analytical method specified in the permit shall be used to monitor the amount of the pollutant in the outfall to this level, provided that the laboratory analyst has complied with the specified quality assurance/quality control procedures in the relevant method. Monitoring results that are lower than this level must be reported, but shall not be used to determine compliance with the calculated limit. This PQL can be neither lowered nor raised without a modification of this permit.	Type I or Type II Action Levels are monitoring requirements, as defined below in Note 2, that trigger additional monitoring and permit review when exceeded.	This can include units of flow, pH, mass, Temperature, concentration. Examples include µg/l, lbs/d, etc.	Examples include Daily, 3/week, weekly, 2/month, monthly, quarterly, 2/yr and yearly.	Examples include grab, 24 hour composite and 3 grab samples collected over a 6 hour period.

Note 1: DAILY DISCHARGE: The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants expressed in units of mass, the 'daily discharge' is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the 'daily discharge' is calculated as the average measurement of the pollutant over the day. DAILY MAX: The highest allowable daily discharge. DAILY MIN: The lowest allowable daily discharge. MONTHLY AVG (daily avg): The highest allowable average of daily discharges over a calendar month, calculated as the sum of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. RANGE: The minimum and maximum instantaneous measurements for the reporting period must remain between the two values shown. 7 DAY ARITHMETIC MEAN (7 day average): The highest allowable average of daily discharges over a calendar week. 12 MRA (twelve month rolling avg): The average of the most recent twelve month's monthly averages. 30 DAY GEOMETRIC MEAN (30 d geo mean): The highest allowable geometric mean of daily discharges over a calendar month, calculated as the antilog of : the sum of the log of each of the daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. 7 DAY GEOMETRIC MEAN (7 d geo mean): The highest allowable geometric mean of daily discharges over a calendar week.

Note 2: ACTION LEVELS: Routine Action Level monitoring results, if not provided for on the Discharge Monitoring Report (DMR) form, shall be appended to the DMR for the period during which the sampling was conducted. If the additional monitoring requirement is triggered as noted below, the permittee shall undertake a short-term, high-intensity monitoring program for the parameter(s). Samples identical to those required for routine monitoring purposes shall be taken on each of at least three consecutive operating and discharging days and analyzed. Results shall be expressed in terms of both concentration and mass, and shall be submitted no later than the end of the third month following the month when the additional monitoring requirement was triggered. Results may be appended to the DMR or transmitted under separate cover to the same address. If levels higher than the Action Levels are confirmed, the permit may be reopened by the Department for consideration of revised Action Levels or effluent limits. The permittee is not authorized to discharge any of the listed parameters at levels which may cause or contribute to a violation of water quality standards. TYPE I: The additional monitoring requirement is triggered upon receipt by the permittee of any monitoring results in excess of the stated Action Level. TYPE II: The additional monitoring requirement is triggered upon receipt by the permittee of any monitoring results that show the stated action level exceeded for four of six consecutive samples, or for two of six consecutive samples by 20 % or more, or for any one sample by 50 % or more.

PERMIT LIMITS, LEVELS AND MONITORING

OUTFALL No.	LIMITATIONS APPLY:	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Esopus Creek	02/01/2010	9/30/2011

PARAMETER	EFFLUENT LIMIT					MONITORING REQUIREMENTS				FN
	Type	Limit	Units	Limit	Units	Sample Frequency	Sample Type	Location Inf	Location Eff	
Flow	Monthly Average	1.6	MGD			Continuous			x	
BOD_5 (Nov 1st – May 31st)	Monthly Average	30	mg/l	400	lbs/d	1 / week	24 hr composite	x	x	1
BOD_5 (Nov 1st – May 31st)	7 Day Average	45	mg/l	600	lbs/d	1 / week	24 hr composite		x	
$CBOD_5$ (June 1st – Oct 31st)	Daily Maximum	Monitor	mg/l			1 / week	24 hr composite	x	x	1,3
UOD (June 1st – Oct 31st)	Daily Maximum			1000	lbs/d	1 / week	Calculated		x	2
Solids, Total Suspended	Monthly Average	30	mg/l	400	lbs/d	1 / week	24 hr composite	x	x	1
Solids, Total Suspended	7 Day Average	45	mg/l	600	lbs/d	1 / week	24 hr composite		x	
Solids, Settleable	Daily Maximum	0.3	ml/l			2 / day	Grab		x	
pH	Range	6.5 – 8.5	SU			2 / day	Grab		x	
Nitrogen, Ammonia (as N) (June 1st – Oct 31st)	Monthly Average	7.0	mg/l			1 / week	24 hr composite		x	
Nitrogen, TKN (as N) (June 1st – Oct 31st)	Daily Maximum	Monitor	mg/l			1 / week	24 hr composite		x	3
Effluent Disinfection required: [ ] All Year [x] Seasonal from May 1st to Oct 31st										
Coliform, Fecal	30 Day Geometric Mean	200	No./ 100 ml			1 / week	Grab		x	
Coliform, Fecal	7 Day Geometric Mean	400	No./ 100 ml			1 / week	Grab		x	

FOOTNOTES:

1. Effluent shall not exceed 15 % of influent concentration values for following: BOD_5, $CBOD_5$, & TSS.
2. Ultimate Oxygen Demand shall be computed as follows: UOD = 1.5 X $CBOD_5$ + 4.5 X TKN (Total Kjeldahl Nitrogen).
3. Samples for $CBOD_5$ and TKN should be collected at the same time to calculate UOD.

ACTION LEVELS AND MONITORING

OUTFALL NUMBER	LEVELS APPLY:	RECEIVING WATER	EFFECTIVE	EXPIRING
001	All year unless otherwise noted	Esopus Creek	02/01/2010	9/30/2011

PARAMETER	EFFLUENT LIMIT		MONITORING ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max					
Copper		0.8		lbs/day	1 / month	24 hr. composite	
Lead		0.21		lbs/day	1 / month	24 hr composite	
Bis(2-ethylhexyl)phthalate		0.38		lbs/day	1 / quarter	24 hr composite	4
Zinc			2.5	lbs/day	1 / quarter	24 hr composite	
Nickel			0.25	lbs/day	1 / quarter	24 hr composite	
WET-Acute Invertebrate			0.3	TU	1 / quarter	See Footnote	5
WET-Acute Vertebrate			0.3	TU	1 / quarter	See Footnote	5
WET-Chronic Invertebrate			5	TU	1 / quarter	See Footnote	5
Wet-Chronic Vertebrate			5	TU	1 / quarter	See Footnote	5

OUTFALL NUMBER	TYPE of DISCHARGE	RECEIVING WATER	EFFECTIVE	EXPIRING
002, 003, 004	Stormwater Runoff	Esopus Creek	02/01/2010	9/30/2011

PARAMETER	EFFLUENT LIMIT		MONITORING ACTION LEVEL	UNITS	SAMPLE FREQUENCY	SAMPLE TYPE	FN
	Monthly Avg	Daily Max					
Chemical Oxygen Demand			120	mg/l	1 / year	Grab	6
Suspended Solids, Total		Monitor		mg/l	1 / year	Grab	

Footnotes on page 5 of 11.

FOOTNOTES:

4. This is an interim limit. The final limit will be determined upon review of the results of the Short-term High Intensity Monitoring Program in this permit. See page 6 for details.

5. Whole Effluent Toxicity (WET) Testing:
Testing Requirements - WET testing shall consist of **Chronic only**. WET testing shall be performed in accordance with 40 CFR Part 136 and TOGS 1.3.2 unless prior written approval has been obtained from the Department. The test species shall be *Ceriodaphnia dubia* (water flea - invertebrate) and *Pimephales promelas* (fathead minnow - vertebrate). Receiving water collected upstream from the discharge should be used for dilution. All tests conducted should be static-renewal (two 24 hr composite samples with one renewal for Acute tests and three 24 hr composite samples with two renewals for Chronic tests). The appropriate dilution series bracketing the IWC and including one exposure group of 100% effluent should be used to generate a definitive test endpoint, otherwise an immediate rerun of the test is required. WET testing shall be coordinated with the monitoring of chemical and physical parameters limited by this permit so that the resulting analyses are also representative of the sample used for WET testing. The ratio of critical receiving water flow to discharge flow (i.e. dilution ratio) is **2:1** for acute, and **4:1** for chronic. Discharges which are disinfected using chlorine should be dechlorinated prior to WET testing or samples shall be taken immediately prior to the chlorination system.

   Monitoring Period - WET testing shall be performed at the specified sample frequency **during calendar years ending in 0 and 5 .**

   Reporting - Toxicity Units shall be calculated and reported on the DMR as follows: TUa = (100)/(48 hr LC50) or (100)/(48 hr EC50) (note that Acute data is generated by both Acute and Chronic testing) and TUc = (100)/(NOEC) when Chronic testing has been performed or TUc = (TUa) x (10) when only Acute testing has been performed and is used to predict Chronic test results, where the 48 hr LC50 or 48 hr EC50 and NOEC are expressed in % effluent. This must be done for both species and using the Most Sensitive Endpoint (MSE) or the lowest NOEC and corresponding highest TUc. Report a TUa of 0.3 if there is no statistically significant toxicity in 100% effluent as compared to control.

   The complete test report including all corresponding results, statistical analyses, reference toxicity data, daily average flow at the time of sampling and other appropriate supporting documentation, shall be submitted within 60 days following the end of each test period to the Toxicity Testing Unit. A summary page of the test results for the invertebrate and vertebrate species indicating TUa, 48 hr LC50 or 48 hr EC50 for Acute tests and/or TUc, NOEC, IC25, and most sensitive endpoints for Chronic tests, should also be included at the beginning of the test report.

   WET Testing Action Level Exceedances - If an action level is exceeded then the Department may require the permittee to conduct additional WET testing including Acute and/or Chronic tests. Additionally, the permittee may be required to perform a Toxicity Reduction Evaluation (TRE) in accordance with Department guidance. If such additional testing or performance of a TRE is necessary, the permittee shall be notified in writing by the Regional Water Engineer. The written notification shall include the reason(s) why such testing or a TRE is required.

6. The COD action level is intended as a guideline for the permittee to determine the overall effectiveness of the SWPPP in controlling the discharge of pollutants to receiving waters. If exceedance of the action level occurs, the permittee shall evaluate potential sources of stormwater contaminants at the facility. Any sources of contamination that are identified must be remedied. The facility's SWPPP must be updated to reflect any revisions within 14 days of the inspection for items that can be readily resolved. If corrective actions at the facility do not result in achieving the action level, the facility must continue efforts to implement additional Best Management Practices. Failure to undertake and document the review or take the necessary corrective actions is violation of the permit.

SPECIAL CONDITIONS:

DISCHARGE NOTIFICATION REQUIREMENTS - *Sign Maintenance:* The permittee shall periodically inspect the outfall identification sign(s) in order to ensure they are maintained, are still visible, and contain information that is current and factually correct. Signs that are damaged or incorrect shall be replaced within 3 months of inspection. *Data Retention:* The permittee shall retain records for a minimum period of 5 years in accordance with 6NYCRR Part 750-1.12(b)(2) and Part 750-2.5(c)(1). These records, which include discharge monitoring reports (DMRs) and annual reports, must be retained at a repository accessible to the public. This repository shall be open to the public, at a minimum, during normal daytime business hours. The repository may be the business office, wastewater treatment plant, village, town, city, or county clerk's office, the local library, or other location approved by the Department.

SCHEDULE OF COMPLIANCE

a) The permittee shall comply with the following schedule:

Short-Term High-Intensity Monitoring

Outfall Number(s)	Compliance Action	Due Date
001	The permittee shall conduct sampling for the analysis of Bis(2-ethylhexyl)phthalate in the WWTP effluent. Sampling shall be once per week for a period of 3 months. All sampling and analytical results, along with the average flow of each sampling event shall be submitted to the Department. After the review of the results, the Department may reopen the permit to include the quantification and removal requirement in the permit.	06/01/2010

The above compliance actions are one time requirements. The permittee shall comply with the above compliance actions to the Department's satisfaction once. When this permit is administratively renewed by NYSDEC letter entitled "SPDES NOTICE/RENEWAL APPLICATION/PERMIT," the permittee is not required to repeat the submission(s) noted above. The above due dates are independent from the effective date of the permit stated in the letter of "SPDES NOTICE/RENEWAL APPLICATION/PERMIT."

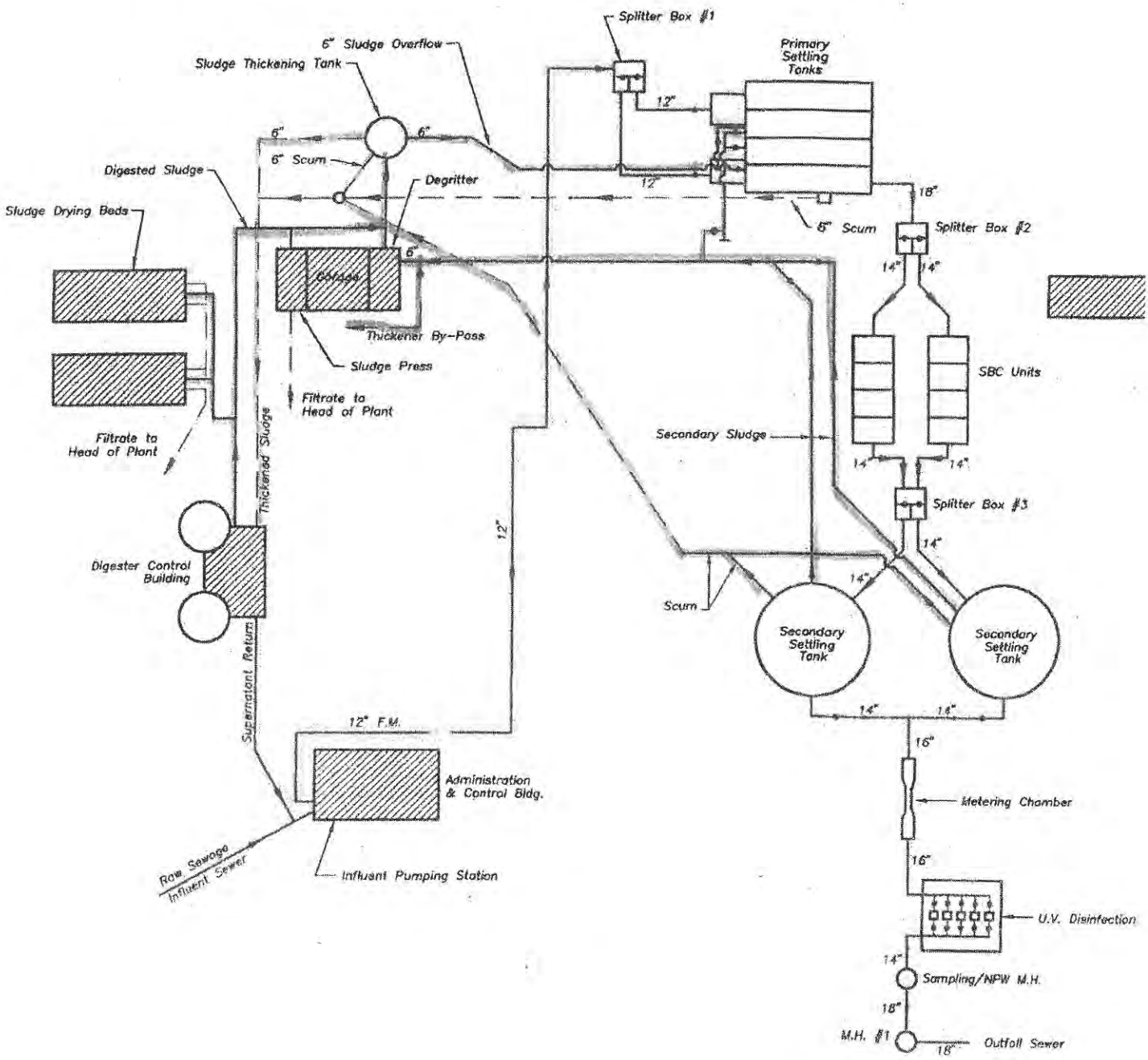
b) The permittee shall submit a written notice of compliance or non-compliance with each of the above schedule dates no later than 14 days following each elapsed date, unless conditions require more immediate notice as prescribed in 6 NYCRR Part 750-1.2(a) and 750-2. All such compliance or non-compliance notification shall be sent to the locations listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS. Each notice of non-compliance shall include the following information:

1. A short description of the non-compliance;
2. A description of any actions taken or proposed by the permittee to comply with the elapsed schedule requirements without further delay and to limit environmental impact associated with the non-compliance;
3. A description or any factors which tend to explain or mitigate the non-compliance; and
4. An estimate of the date the permittee will comply with the elapsed schedule requirement and an assessment of the probability that the permittee will meet the next scheduled requirement on time.

c) The permittee shall submit copies of any document required by the above schedule of compliance to NYSDEC Regional Water Engineer at the location listed under the section of this permit entitled RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS and to the Bureau of Water Permits, 625 Broadway, Albany, N.Y. 12233-3505, unless otherwise specified in this permit or in writing by the Department.

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) specified below:



Additional monitoring locations:

- Outfall 002 – stormwater sampling point #1 conveys stormwater from the main gate area and includes yard drains around primary clarification tanks, secondary clarification tanks, SBC, blower building, and UV building.
- Outfall 003 – stormwater sampling point #2 conveys stormwater from the parking area and a portion of the control building roof drains.
- Outfall 004 – stormwater sampling point #3 conveys stormwater from the parking area between the control building and digester building, digester building roof drains, and a portion of the control building roof drains.

STORM WATER POLLUTANT PREVENTION PLAN FOR POTWs WITH STORMWATER OUTFALLS

1. General - The Department has determined that stormwater discharges from POTWs with design flows at or above 1 mgd shall be covered under the SPDES permit. If the permittee has already submitted a Notice of Intent to the Department for coverage under the General Storm Water permit, the permittee shall submit a Notice of Termination to the Department upon receipt of this final SPDES permit containing the requirement to develop a SWPPP.

The permittee is required to develop, maintain, and implement a Storm Water Pollutant Prevention Plan (SWPPP) to prevent releases of significant amounts of pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and other stormwater discharges including, but not limited to, drainage from raw material storage.

The SWPPP shall be documented in narrative form and shall include the 13 minimum elements below and plot plans, drawings, or maps necessary to clearly delineate the direction of stormwater flow and identify the conveyance, such as ditch, swale, storm sewer or sheet flow, and receiving water body. Other documents already prepared for the facility such as a Safety Manual or a Spill Prevention, Control and Countermeasure (SPCC) plan may be used as part of the SWPPP and may be incorporated by reference. A copy of the current SWPPP shall be submitted to the Department as required in item (2.) below and a copy must be maintained at the facility and shall be available to authorized Department representatives upon request.

2. Compliance Deadlines - The initial completed SWPPP shall be submitted by **08/01/2010** to the Regional Water Engineer. The SWPPP shall be implemented within 6 months of submission, unless a different time frame is approved by the Department. The SWPPP shall be reviewed annually and shall be modified whenever: (a) changes at the facility materially increase the potential for releases of pollutants; (b) actual releases indicate the SWPPP is inadequate, or (c) a letter from the Department identifies inadequacies in the SWPPP. The permittee shall certify in writing, as an attachment to the December Discharge Monitoring Report (DMR), that the annual review has been completed. All SWPPP revisions (with the exception of minimum elements - see item (4.B.) below) must be submitted to the Regional Water Engineer within 30 days. Note that the permittee is not required to obtain Department approval of the SWPPP (or of any minimum elements) unless notified otherwise. Subsequent modifications to or renewal of this permit does not reset or revise these deadlines unless a new deadline is set explicitly by such permit modification or renewal.

3. Facility Review - The permittee shall review all facility components or systems (including but not limited to material storage areas; in-plant transfer, process, and material handling areas; loading and unloading operations; storm water, erosion, and sediment control measures; process emergency control systems; and sludge and waste disposal areas) where materials or pollutants are used, manufactured, stored or handled to evaluate the potential for the release of pollutants to the waters of the State. In performing such an evaluation, the permittee shall consider such factors as the probability of equipment failure or improper operation, cross-contamination of storm water by process materials, settlement of facility air emissions, the effects of natural phenomena such as freezing temperatures and precipitation, fires, and the facility's history of spills and leaks. The relative toxicity of the pollutant shall be considered in determining the significance of potential releases.

The review shall address all substances present at the facility that are identified in Tables 6-10 of SPDES application Form NY-2C (available at *http://www.dec.state.ny.us/website/dcs/permits/olpermits/form2c.pdf*) as well as those that are required to be monitored by the SPDES permit.

4. A. 13 Minimum elements - Whenever the potential for a release of pollutants to State waters is determined to be present, the permittee shall identify Best Management Practices (BMPs) that have been established to prevent or minimize such potential releases. Where BMPs are inadequate or absent, appropriate BMPs shall be established. In selecting appropriate BMPs, the permittee shall consider good industry practices and, where appropriate, structural measures such as secondary containment and erosion/sediment control devices and practices. USEPA guidance for development of minimum elements of the SWPPP and BMPs is available in the September 1992 manual *Storm Water Management for Industrial Activities,* EPA 832-R-92-006 (available on-line at http://nepis.epa.gov/pubtitleOW.htm) At a minimum, the plan shall include the following elements:

1. Pollution Prevention Team
2. Reporting of BMP Incidents
3. Risk Identification & Assessment
4. Employee Training
5. Inspections and Records
6. Security
7. Preventive Maintenance
8. Good Housekeeping
9. Materials/Waste Handling, Storage, & Compatibility
10. Spill Prevention & Response
11. Erosion & Sediment Control
12. Management Runoff
13. Street Sweeping

STORM WATER POLLUTANT PREVENTION PLAN FOR POTWs WITH STORMWATER OUTFALLS - Continued

Note that for some facilities, especially those with few employees, some of the above may not be applicable. It is acceptable in these cases to indicate "Not Applicable" for the portion(s) of the SWPPP that do not apply to your facility, along with an explanation, for instance if street sweeping did not apply because no streets exist at the facility.

B. Stormwater Pollution Prevention Plans (SWPPPs) Required for Discharges of Stormwater From Construction Activity to Surface Waters - As part of the erosion of and sediment control element, a SWPPP shall be developed prior to the initiation of any site disturbance of one acre or more of uncontaminated area. Uncontaminated area means soils or groundwater which are free of contamination by any toxic or non-conventional pollutants identified in Tables 6-10 of SPDES application Form NY-2C. Disturbance of any size contaminated area(s) and the resulting discharge of contaminated stormwater is not authorized by this permit unless the discharge is under State or Federal oversight as part of a remedial program or after review by the Regional Water Engineer; nor is such discharge authorized by any SPDES general permit for stormwater discharges. SWPPPs are not required for discharges of stormwater from construction activity to groundwaters.

The SWPPP shall conform to the *New York Standards and Specifications for Erosion and Sediment Control* and *New York State Stormwater Management Design Manual,* unless a variance has been obtained from the Regional Water Engineer, and to any local requirements. The permittee shall submit a copy of the SWPPP and any amendments thereto to the local governing body and any other authorized agency having jurisdiction or regulatory control over the construction activity at least 30 days prior to soil disturbance. The SWPPP shall also be submitted to the Regional Water Engineer if contamination, as defined above, is involved and the permittee must obtain a determination of any SPDES permit modifications and/or additional treatment which may be required prior to soil disturbance. Otherwise, the SWPPP shall be submitted to the Department only upon request. When a SWPPP is required, a properly completed *Notice of Intent* (NOI) form shall be submitted (available at *www.dec.state.ny.us/website/dow/toolbox/swforms.html*) prior to soil disturbance. Note that submission of a NOI is required for informational purposes; the permittee is not eligible for and will not obtain coverage under any SPDES general permit for stormwater discharges, nor are any additional permit fees incurred. SWPPPs must be developed and submitted for subsequent site disturbances in accordance with the above requirements. The permittee is responsible for ensuring that the provisions of each SWPPP are properly implemented.

MERCURY MINIMIZATION PROGRAM

The permittee shall inspect each tributary dental facility at least once every five years to verify compliance with the wastewater treatment and notification elements of 6NYCRR Part 374.4. Inspection and/or outreach to other industrial/commercial sectors which may contribute mercury is also recommended. All new or increased tributary discharges, including hauled wastes, which are from sources that are industrial in nature must be evaluated for mercury content and if levels exceed 500 ng/L then authorization must be obtained from the Department prior to acceptance. A file shall be maintained containing the notices submitted by dental offices and all other pertinent information. This file shall be available for review by DEC representatives and copies shall be provided upon request. Note that a permit modification may be necessary to include more stringent requirements for POTWs which do not maintain low mercury effluent levels.

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

a) The permittee shall also refer to 6 NYCRR Part 750-1.2(a) and 750-2 for additional information concerning monitoring and reporting requirements and conditions.

b) The monitoring information required by this permit shall be summarized, signed and retained for a period of five years from the date of the sampling for subsequent inspection by the Department or its designated agent. **Also, monitoring information required by this permit shall be summarized and reported by submitting;**

[x] (if box is checked) completed and signed Discharge Monitoring Report (DMR) forms for each 1 month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.

[ ] (if box is checked) an annual report to the Regional Water Engineer at the address specified below. The annual report is due by February 1 and must summarize information for January to December of the previous year in a format acceptable to the Department.

[x] (if box is checked) a monthly "Wastewater Facility Operation Report..." (form 92-15-7) to the:
[x] Regional Water Engineer and/or [ ] County Health Department or Environmental Control Agency specified below

Send the DMRs with **original signatures** to:

Department of Environmental Conservation
Division of Water
Bureau of Water Compliance Programs
625 Broadway, 4th floor
Albany, New York 12233-3506

Phone: (518) 402-8177

Send a **copy** of each DMR page to:

Department of Environmental Conservation
John Sansalone
21 South Putt Corners Road
New Paltz, New York 12561-1696

Phone: (914) 428-3019

c) Noncompliance with the provisions of this permit shall be reported to the Department as prescribed in 6 NYCRR Part 750-1.2(a) and 750-2.

d) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

e) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculations and recording of the data on the Discharge Monitoring Reports.

f) Calculation for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

g) Unless otherwise specified, all information recorded on the Discharge Monitoring Report shall be based upon measurements and sampling carried out during the most recently completed reporting period.

h) Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section five hundred two of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be sent to the Environmental Laboratory Accreditation Program, New York State Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller Empire State Plaza, Albany, New York 12201.

APPENDIX F
PHASE 1A – ARCHEOLOGICAL STUDY
BY JOE DIAMOND

PHASE 1A LITERATURE REVIEW AND ARCHAEOLOGICAL SENSITIVITY

PROPOSED TECH CITY ADDITIONS

BOICES LANE and ENTERPRISE DRIVE

TOWN OF ULSTER, ULSTER CO., NY

PREPARED FOR:

MR. NICK WOERNER,

SUPERVISOR,

TOWN OF ULSTER

TOWN OF ULSTER TOWN HALL

1 TOWN HALL DRIVE

LAKE KATRINE, NY 12449

MAY 30th, 2009

PREPARED BY: JOSEPH E. DIAMOND, Ph.D.

290 OLD ROUTE 209,

HURLEY, N.Y. 12443

845-338-0091

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island Resource Center, PO Box 189, Waterford, NY 12188-0189 (Mail)
Delaware Avenue, Cohoes 12047 (Delivery)
(518) 237-8343

PROJECT REVIEW COVER FORM

Rev. 10-04

Please complete this form and attach it to the top of any and all information submitted to this office for review. Accurate and complete forms will assist this office in the timely processing and response to your request.

This information relates to a previously submitted project.

PROJECT NUMBER ____ PR_____

COUNTY Ulster

☐ If you have checked this box and noted the previous Project Review (PR) number assigned by this office you do not need to continue unless any of the required information below has changed.

2. This is a new project. ☒ If you have checked this box you will need to complete ALL of the following information.

Project Name Tech City GEIS

Location Enterprise Drive
You MUST include street number, street name and/or County, State or Interstate route number if applicable

City/Town/Village Town of Ulster
List the correct municipality in which your project is being undertaken. If in a hamlet you must also provide the name of the town.

County Ulster
If your undertaking* covers multiple communities/counties please attach a list defining all municipalities/counties included.

TYPE OF REVIEW REQUIRED/REQUESTED (Please answer both questions)

A. Does this action involve a permit approval or funding, now or ultimately from any other governmental agency?

☐ No ☒ Yes

If Yes, list agency name(s) and permit(s)/approval(s)

Agency Involved	Type of permit/approval	State	Federal
SEQRA		☐	☐
		☐	☐
		☐	☐

B. Have you consulted the NYSHPO web site at http://www.nysparks.state.ny.us/shpo to determine the preliminary presence or absence of previously identified cultural resources within or adjacent to the project area? If yes: ☒ Yes ☐ No

Was the project site wholly or partially included within an identified archeologically sensitive area? ☒ Yes ☐ No

Does the project site involve or is it substantially contiguous to a property listed or recommended for listing in the NY State or National Registers of Historic Places? ☐ Yes ☒ No

CONTACT PERSON FOR PROJECT

Name Dan Shuster **Title** Planning Consultant
Firm/Agency Shuster Associates
Address 3578 Atwood Road **City** Stone Ridge **STATE** NY **Zip** 12484
Phone (845) 687-0758 **Fax** (845) 687-0814 **E-Mail** dan@shusterassociates.com

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CULTURAL RESOURCE INVESTIGATION

Management Summary

SHPO: Project Review #:

Involved State and Federal Agencies: **SEQRA**

Phase of Survey: **Phase 1A**

Location Information:
TOTAL Survey Area (Metric and English): **138 acres/55.85 Ha**
Length: **about 4000 ft/ 1219 m at its longest (N/S)**
Width: **about 2000 ft/ 610 m (E/W)**

USGS 7.5 Minute Quadrangle Map: **Along western edge of Kingston East Quadrangle.**

Results of Archaeological Survey
Number & name of prehistoric sites identified: **None**
Number & name of historic sites identified: **None**

Results of Architectural Survey
Number of buildings/structures/cemeteries within project area: **None**
Number of buildings/structures/cemeteries adjacent to project area: **None**
Number of previously determined NR listed or eligible buildings/ structures/cemeteries/districts adjacent to project area: **See Table 1**
Number of identified eligible buildings/structures/cemeteries/districts: **None**

Report Author (s): **Joseph E. Diamond, Ph.D.**

Date of Report: **5 /30/09**

PHASE 1A ARCHAEOLOGICAL SURVEY

Introduction

This cultural resource survey was conducted to evaluate proposed changes to the industrial complex known as Tech City in the Town of Ulster, Ulster County, NY. (Map 1 and 2). Tech City is the former IBM complex that has recently been converted into multiple uses for various businesses. As a result, many of the impacts to the landform that the site was constructed on occurred in the 1960's. The project location is bounded on the east edge by the tracks of the New York Central Railroad, on the south by Boices Lane, on the west by Enterprise Drive, and on the north by Old Neighborhood Road (See Map 2, 3, and 4).

The project area is a trapezoidal parcel that is 4000 feet in length (N/S) and 2000 feet in width (E/W). Map 3 shows existing conditions, Map 4 shows proposed additions. The parcel is about 138 acres (55.85 Ha), and construction impacts are proposed for three main areas. These are 1) the northwest corner (Photographs 1 and 2, Map 4: A), where four large buildings will be constructed in what is now a large parking area, 2) the central portion (Map 4: D), where a building will be removed to form a parking lot, and 3) the southeast corner, where existing parking lots and lawns will be the home to five proposed buildings (Photographs 3, 4 and 5: Map 4: C and E). Construction impacts include building footprints, utilities, regrading , and additional parking.

The author was contacted by Mr. Dan Shuster of Shuster Associates, Stone Ridge, NY. A literature survey was conducted at OPRHP on 5/112/09 by Croshier Archaeological Research.

Environmental/Physical Setting

The project area is a trapezoidally shaped parcel bounded primarily by commercial and light industrial businesses in the Town of Ulster. The surrounding area is composed of a combination of small sections of woodland, housing, and commercial buildings.

A walkover of the project area found no locations where natural occurring rock faces or bedrock outcrops break the surface that would be large enough to permit use as prehistoric rockshelters or windbreaks. Most of the project area is a flat glacial outwash terrace. Previous use of the project area has probably included clear cutting several times, as well as use for hay, corn or pastureland. Based on the walkover and the kind of soils that are found there, it is suggested that the majority of this project area was plowed and used for agricultural purposes in the 17th-early 20th centuries.

The flora in the project area is composed of mostly planted trees consisting of maple, sycamore, oak, locust and honey locust, willow, red maple, white pine, hemlock, apple, flowering crabapple (?) and pear. Ground cover consists of large expanses of mowed grass, various flowering plants and shrubbery such as arborvitae and other decorative plantings.

The soils in the project area (Map 5) consist primarily of Riverhead Fine Sandy Loam, 0-3% slope (RvA), with lesser amounts of Pompton Fine Sandy Loam (Pt), Riverhead Fine Sandy Loam, 3-8% slopes (RvB), and Lamson Fine Sandy Loam (Lm) near the northwest corner of the project area (Tornes, Ulster County Soil Survey 1979: Sheet 54). "The Riverhead series consists of coarse-loamy, mixed, mesic Typic Dystrochrepts. These soils are deep, well drained, and nearly level to very steep. They are on deltas. These soils formed mainly in water-laid deltaic deposits that were dropped as the streams entered glacial lakes. They have a moderately coarse textured subsoil. Slope ranges from 0-60 percent, but is dominantly 0-8 percent (Tornes 1979:132)".

The bedrock geology consists of the Lower to Middle Devonian Onondaga Limestone and Ulster Group (Fisher *et al.* 1970: Lower Hudson Sheet). A thorough walkover of the project area revealed no exposed portions of limestone. Limestone exposures occur about 400-500 feet to the east of the project area and extend from Glenerie almost to Port Ewen.

Background Research

PREHISTORIC ARCHAEOLOGICAL SITES

A search of the site files at the Office of Parks, Recreation and Historic Preservation (including the New York State Museum's prehistoric site files) on 5/12/09 by Croshier Archaeological Associates located 19 prehistoric sites within a 1 mile linear radius of the project area. NYSM 755, and OPRHP #'s 000041, and 0007 are probably the same site. Additionally, two nearby sites that are located along the Bear Cat Kill, but did not occur in the site files are included here. These are a sporadic find along

Morton Boulevard (Diamond 2008), and a site form that this author sent in c.1976/77 that was never recorded. The former was an isolated find along the Bear Cat Kill, a small stream to the south of the project area. The latter was a garden area, also located along the bear Cat Kill, that had produced numerous projectile points and petalas blades.

The 1 mile radius was undertaken to examine which sites shared the same landforms as the project area, and also to determine how close previous sites had been found. Of the 21 total pre-Contact (or prehistoric) sites, six are probably small flake scatters with no temporally or culturally diagnostic artifacts probably representing small activity areas (see Table 1).

Within a one mile radius are several large sites. One is a quarry, one is a quarry/ workshop, and several have been subjected to Phase 2 Evaluations and Phase 3 Mitigations. Of particular note are forms sent in for the Boice Farm, which shares the same landform. None of the sites listed in the site files are within the project area. Slightly to the south of the one mile radius, but sharing the same soils is the Kingston Armory Site, a large multi-component site which was subjected to Phase 3 Mitigation in 2007 (LBA 2008). The Kingston Armory Site was a primarily Archaic site with occupations ranging from the Vergennes Phase at c. 4000-3000 BC (Funk 1988, 1993:157) to the Orient Phase at c. 1100-750 BC (Funk 1993:157).

HISTORIC ARCHAEOLOGICAL SITES

The OPRHP files list one historic archaeological site within a 1 mile radius of the project area. This is the Freer's Hotel Midden located by Hartgen Archaeological Associates in 2002.

Three historic maps of the vicinity were consulted to determine if there were any earlier indications of historic structures in the project area. The 1853 Brink and Tillson Map of Ulster County (Map 6), shows no structures within the project area. The 1875 Beers Map of Ulster County (Map 7) shows the basic outline of present day Boices Lane with the house of "H.S. Burhans" just to the west of the project area. This was probably destroyed by the construction of IBM in the 1960's. The 1891 Beers Map (Map 8), likewise shows the "Mrs. H Burhans" structure to the west of the project area. *It should be noted here that depending on the actual placement of the property boundary, that the domocile of "J. Thompson", shown on both the 1875 and 1891 Beers maps could be in the wooded parcel along the edge of the northwest corner of the project area.*

Aside from the Thompson structure, the closest historic structures were several along the northern side of Old Neighborhood Road. These were investigated on 5/24/09 and found to have been destroyed, mostly for recent industrial buildings. A graveyard just to the north of Old Neighborhood Road is evident on the 1875 Beers (Map 7) as a "G Yd". This is shown again on the 1891 Beers (Map 8) as a larger dark rectangle. A cursory examination of the graveyard (Photograph 6) shows its early stones at c.1820, and its latest stones in the 1980's. Most of the headstones are from local families in the area, many of them having Dutch surnames. Examples are VanGaasbeck, VanAken, Terwilliger, Low, Wynkoop, Burhans, Osterhoudt, Brink, Snyder, Myer, TenBroeck, DeHoff and Legg.

Because the historic structures north of Old Neighborhood Road have been destroyed, no OPRHP Historic Structure forms have been completed for this project. The areas to the east, west, and south are all either recent commercial buildings or 1960's houses fronting on Boices Lane.

Sensitivity Assessment

PREHISTORIC

A literature search at OPRHP located 19 recorded prehistoric sites within a 1 mile radius of the project area. To these could be added an additional two that the author has found that are not in the site files. This brings the total to 21 pre-contact sites. Most of these are on the well drained soils characterized by the Riverhead series, and a number are small lithic scatters, quarries and workshops to the east of the project area. Based on the frequency of known nearby prehistoric sites occupying similar soils, particularly those south the project area such as the Kingston Armory Site, the project area should be considered as having a high sensitivity to the presence of prehistoric archaeological resources.

HISTORIC

Based on an examination of historic maps of the project area, combined with a walkover, the possibility of having encountered buried historic archaeological resources in the majority of the project

area is considered very low. There is the possibility of the "J. Thompson" house being in the northwest corner near Old Neighborhood Road.

Recommendations

Due to the project area's location in an area that has 21 prehistoric archaeological sites, it is probable that the construction activities associated with expansion of the Tech City Campus could disturb potential prehistoric sites. Testing should follow those developed by NYAC and outlined in the OPRHP 1994 *Standards*, as well as the recently produced OPRHP 2005 *Guidelines*.

It should be noted that portions of the Tech City Campus have severe and deep disturbances, most notably the northeast corner, where excavations have dropped parking areas approximately 6 feet below grade, and other locations where entry ramps into buildings have also called for deep excavations. In other locations, landscaping has dropped grade approximately 4 feet. These areas need not be tested. Two forms of testing are suggested depending on existing conditions within the Tech City Campus. Photograph locations are keyed to Map 9 and locations where testing is suggested is shown on Map 10. These kinds of areas can be divided into two categories:

Undisturbed Areas. These are open areas of mowed lawn that have not been impacted by parking lot activity or construction (Map 10). These are locations that are probably remnant portions of the plowed fields that preceded the IBM complex. It is recommended that hand-excavated, hand-screened shovel tests be placed at 50 foot (15.2m) intervals (or less) within the Area of Proposed Effect (APE), a procedure called for by OPRHP. All excavated soils should be screened through 1/4 inch hardware mesh and examined for prehistoric and historic artifacts.

Disturbed Areas. Disturbed areas, most notably parking lots, should be cleared with an excavator down to the interface between the parking lot fill and the subsoil (Map 10). This will allow for the inspection and testing of the subsoil for such archaeological features as hearths, earth ovens, storage pits, and post molds. At the Kingston Armory Site, approximately 8300 ft/ 2530 m away and on the same landform, Late Archaic occupations were below the plowzone and extended in a stratified fashion to a depth of 60+cm. It is possible that similar buried horizons still exist under the parking lots at Tech City.

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Marcucci, Derrrick.

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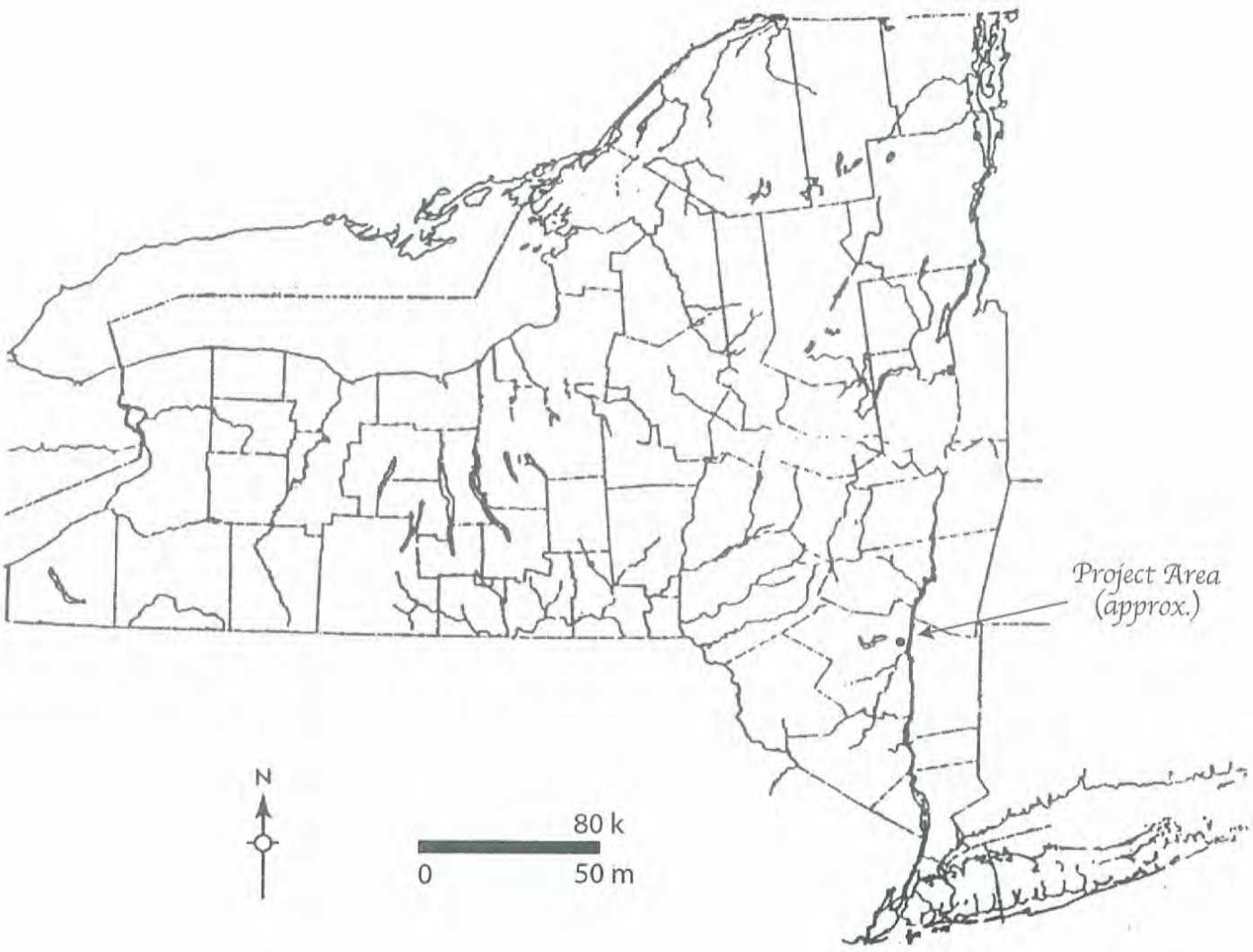
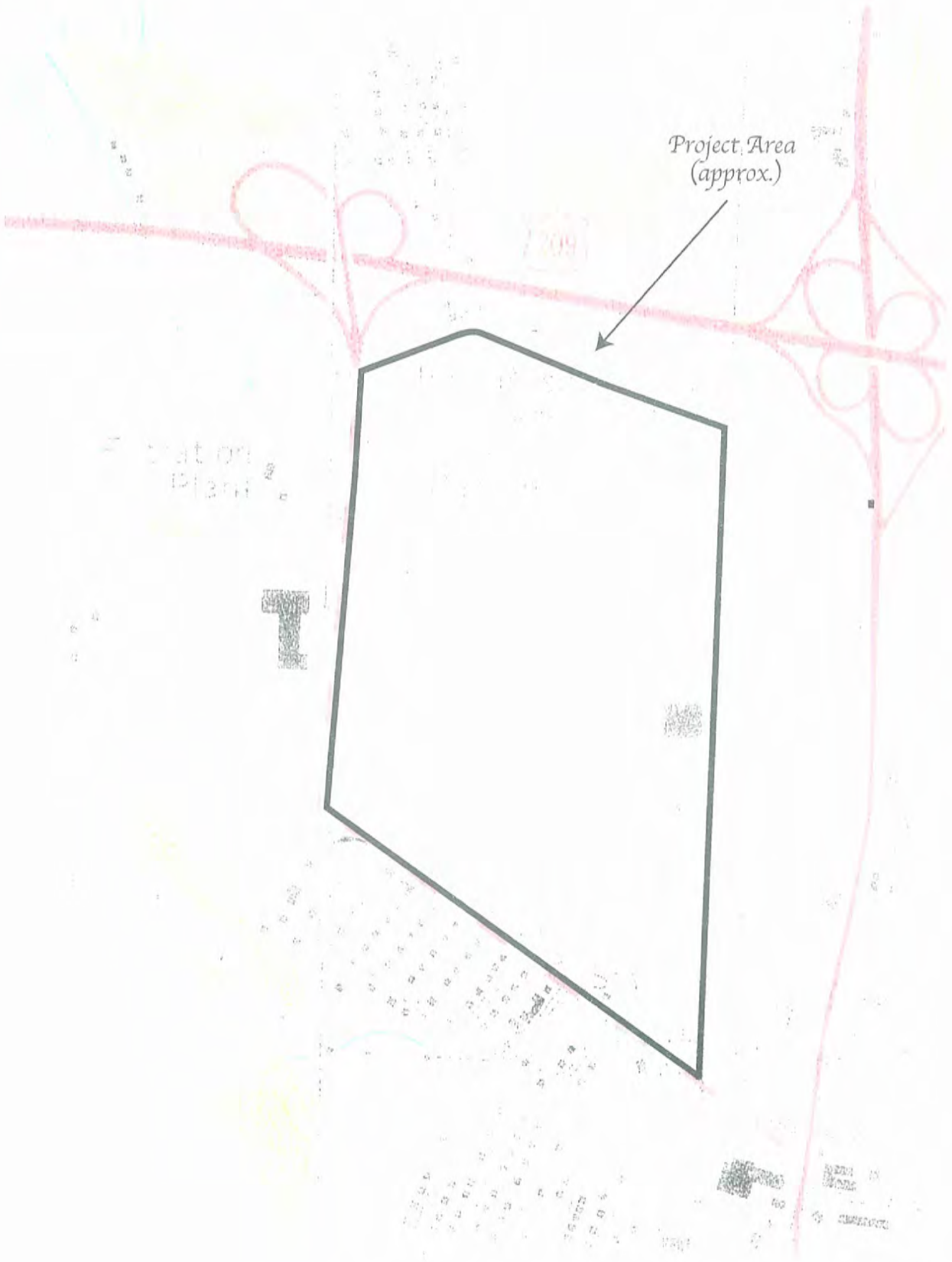
MAPS



Map 1. New York State



Map 2. USGS Kingston West and East Quadrangles

TECH CITY- TOWN OF ULSTER, NY

COMPREHENSIVE DEVELOPMENT PLAN

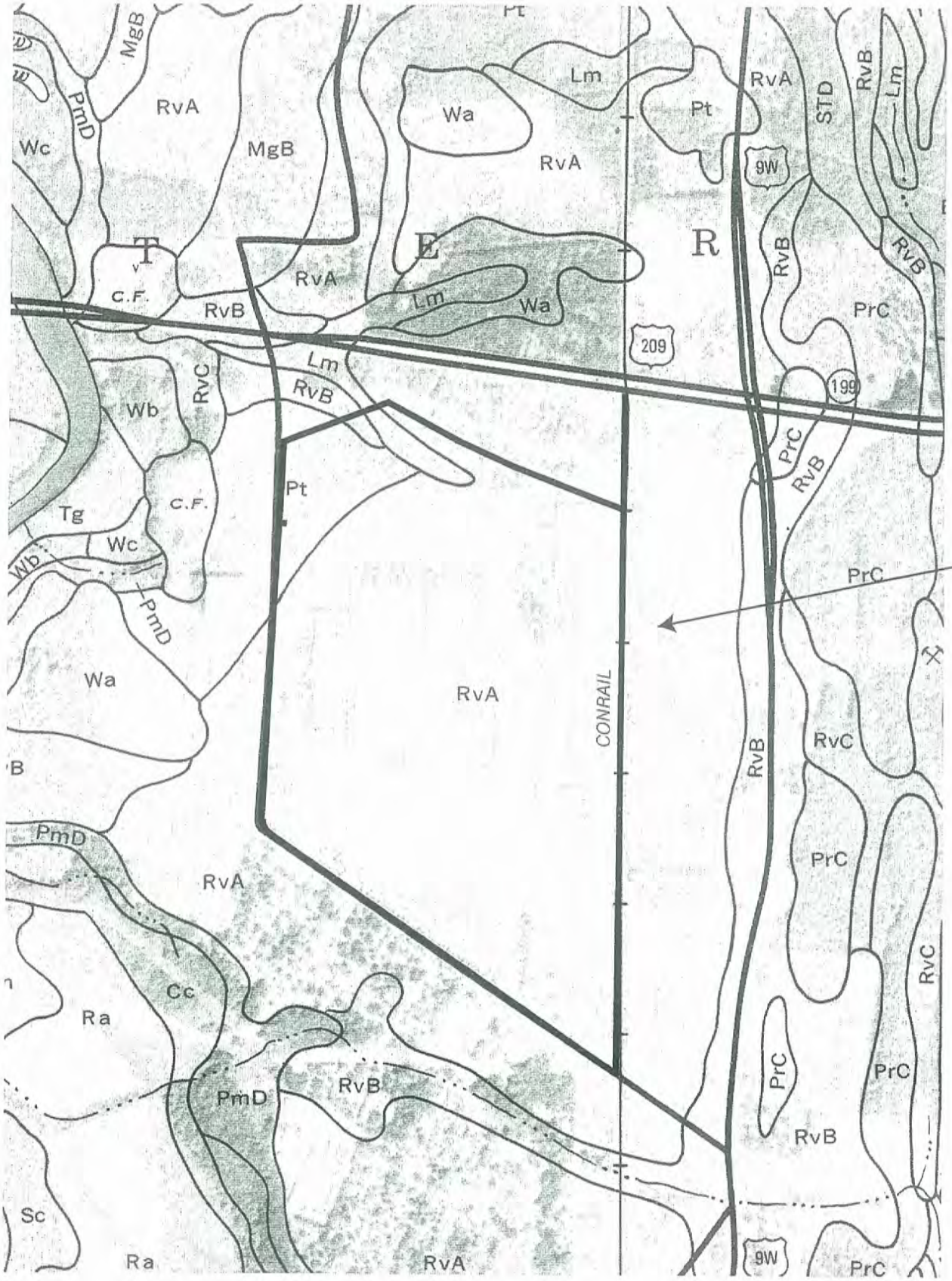
JANUARY 27, 2009

1000 ft. / 305 m.

1

North

Map 4. Comprehensive Development Plan

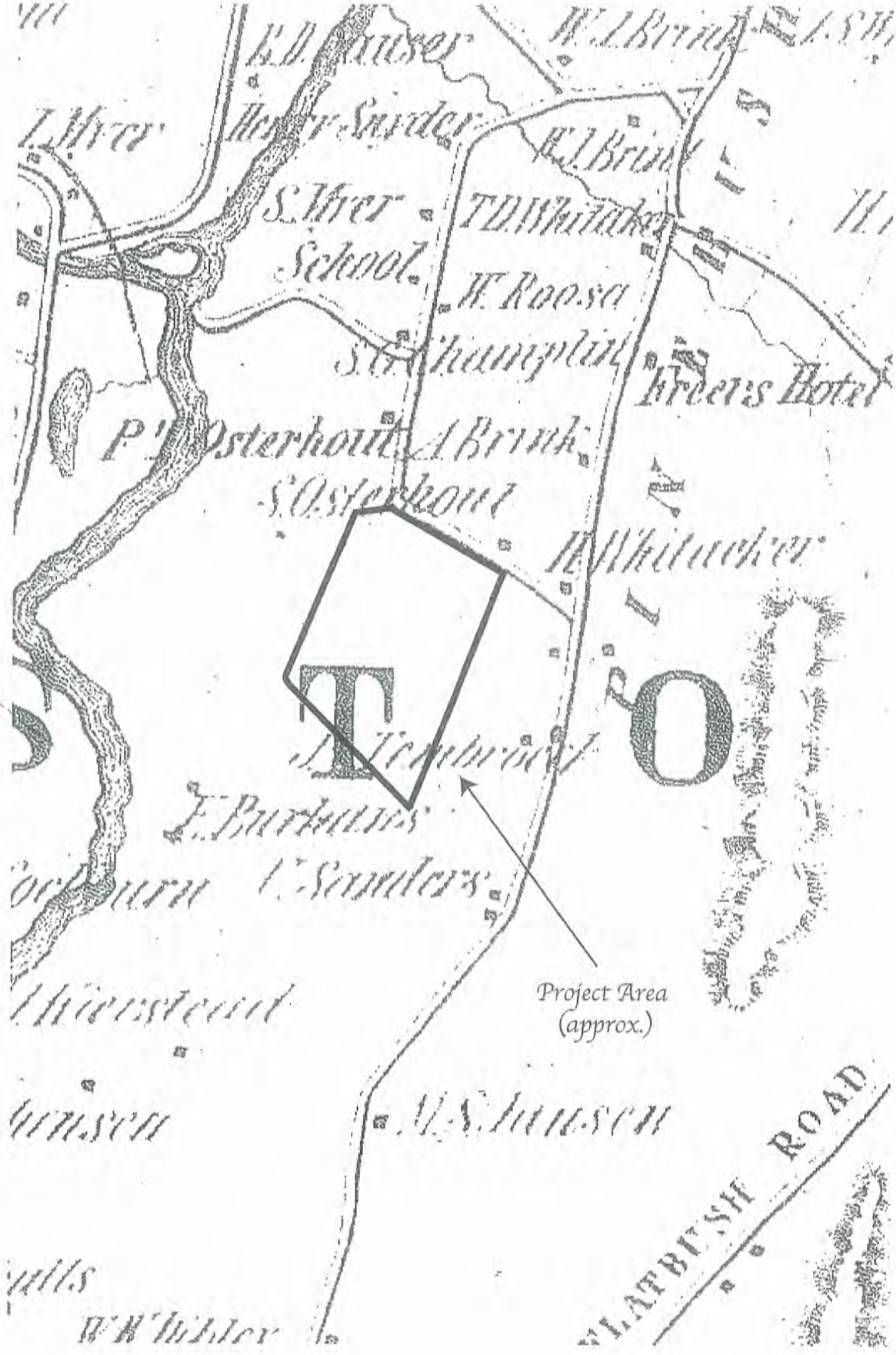


Project Area (approx.)

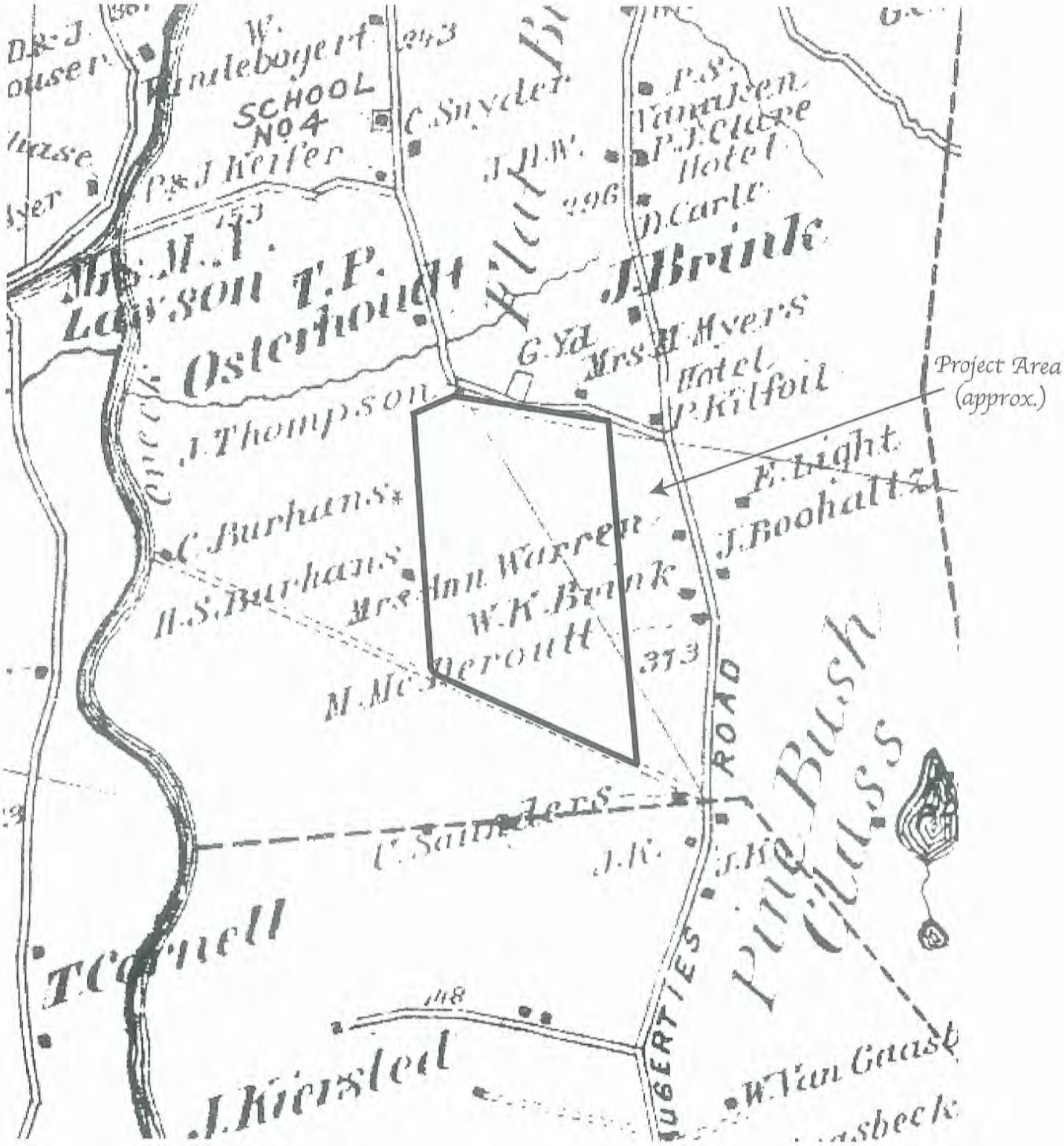
1000 ft. / 305 m.

North

Map 5. Ulster County Soils (sheet 54)



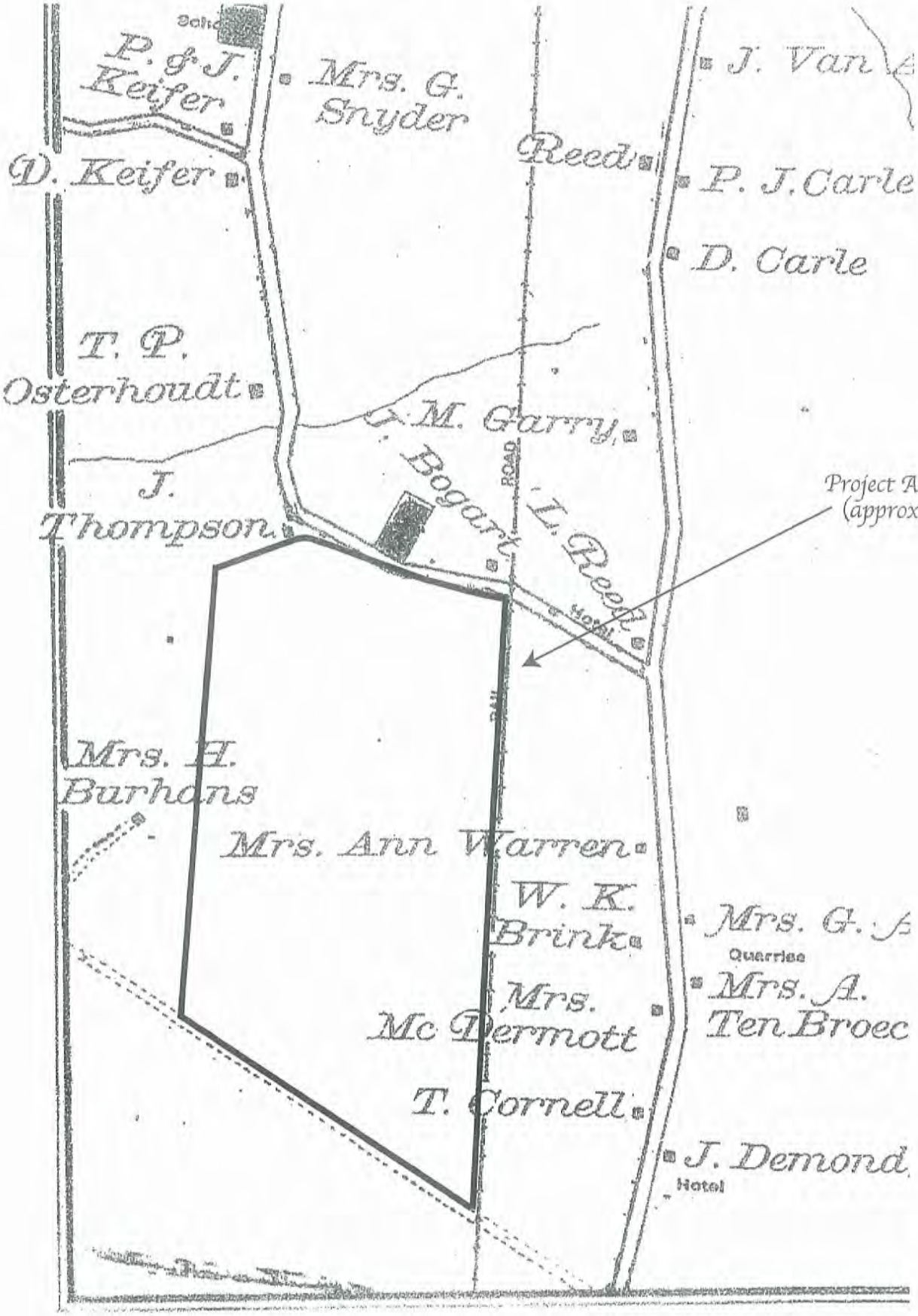
Map 6. 1853 Brink & Tillson Map



2500 ft. / 762 m.

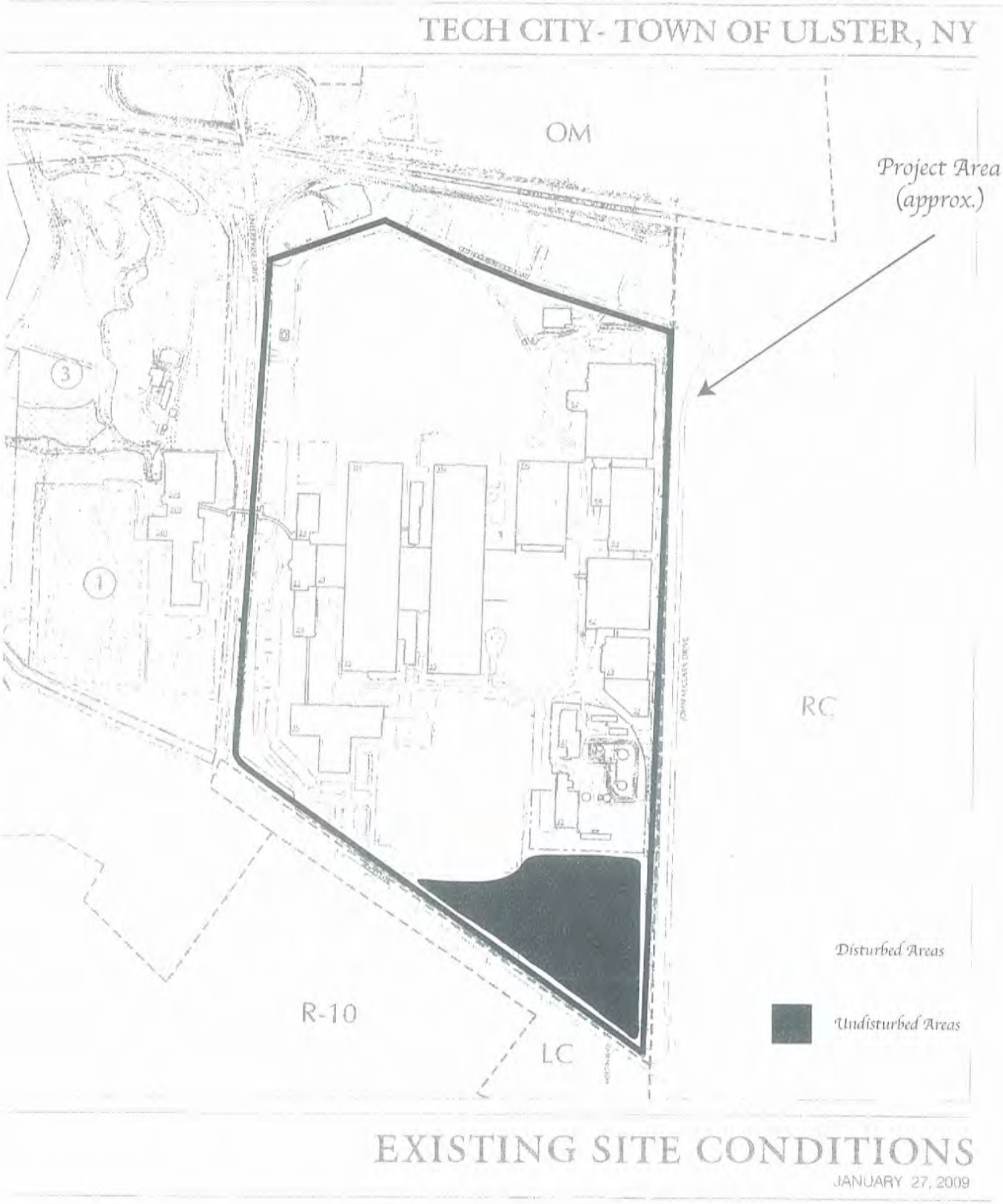
North

Map 7. 1875 Beers Map



Map 8. 1991 Beers Map (sheet 23)

Map 9. Project Map showing photograph locations



Map 10. Project Map showing recommended testing procedure by area

PHOTOGRAPHS

Photograph 1: Parking lot in NW corner of project area. View NW.

Photograph 2. Parking lot in NW corner of project area. View N.

Photograph 3: Parking lot in SE corner of project area. View E.

Photograph 4. Large lawn in SE corner of project area. View N.

Photograph 5: Large lawn in SE corner of project area. View NW.

Photograph 6. Graveyard on Old Neighborhood Road. View N.

TABLES

NYSOPRHP Site #	NYSM #	Site Name	Dist. from APE ft/m	Time Period	Site Type	Ref./Arch
	755	Boices Dairy	750 ft/ 229 m	Multi-Component Pre.	Camps	Funk, R.E/1933 SF
	5041	Village	3000 ft/914 m	Multi-Component Pre.	Camps/Vill.	Parker 1922
	7668	Kingston Site	5500 ft/ 1676 m	Multi-Component Pre.	Camps	Ritchie 1952
	8876	No Name	5000 ft/1524 m	No information	Camps?	Van Sickle 1995
	8877	No Name	5000 ft/1524 m	No information	Camps?	Van Sickle 1995
	9076	No Name	5000 ft/1524 m	No diagnostics	Camps?	Diamond 1996
A111.18.000021		Ulster Road Area#1	2000 ft/610 m	Pre-Contact	SLS	HAA 1993a
A111.18.000022		Ulster Road Area #2 *	4500 ft/ 1372 m	Pre-Contact	SLS	HAA 1993a
A111.18.000023		Ulster Road Area#3 *	3000 ft/914 m	Pre-Contact	SLS	HAA 1993a
A111.18.000024		Ulster Road Area#4 *	3000 ft/914 m	Pre-Contact	SLS	HAA 1993a
A111.18.000025		Zaremba Quarry Site Loc.1	2000 ft/610 m	Pre-Contact	Quarry/WS	HAA 1993b**
A111.18.000026		Zaremba Workshop Site Loc.2	2300 ft/710 m	Pre-Contact	Workshop	HAA 1993b**
A111.18.000041		Site A-Old Boices Property	2500 ft/762 m	Pre-Contact	Camps?	Diamond 2000
A111.18.000046		Precontact Locus 4	2500 ft/762 m	Pre-Contact	SLS	HAA 2002
A111.18.000047		Freers Hotel Midden	2500 ft/762 m	Historic	Hotel	HAA 2002
A111.18.000048		Chambers 54-1	4500 ft/ 1372 m	Orient Phase	Camp	Marcucci 2003
A111.18.000052		Manor Quarry Site *	4500 ft/ 1372 m	Pre-Contact	Quarry	HAA 2002
A111.18.000051		Manor Site *	4500 ft/ 1372 m	Late Archaic	Camps	HAA 2002
A111.18.000038		Ulster Prehistoric Site 1	5000 ft/1524 m	Pre-Contact	Camps?	Diamond 1996
A111.18.000039		Ulster Prehistoric Site 1	5200 ft/1585 m	Late Archaic	Camp	Diamond 1996
A111.18.00007	5041	See NYSM 5041 above				
MHVFCU ***		MHVFCU Site	800 ft/ 244 m	No information	SLS	Diamond 2008
Local site****		No Name***	800 ft/244 m	Multi-component	Camps/Vill.	Diamond 1976
		*National Register Eligible				
		** see also Werner 1994				
		*** Not in Site Files:See text				
		**** Sent in by JD in 1976				
		SF-Site Files				
		SLS-Small Lithic Scatter				

Table 1. Listed sites at NYSM and OPRHP.

APPENDIX G
TRAFFIC STUDY
BY
CREIGHTON MANNING ENGINEERING

Ulster Tech City GEIS

Town of Ulster, New York

CME Project No. 09-024d

Prepared For:

Town of Ulster

October 6, 2009

Prepared By:

CREIGHTON MANNING ENGINEERING, LLP
17 Computer Drive West
Albany, New York 12205
(518) 446-0396

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CHAPTER I
INTRODUCTION

This report summarizes the results of a Traffic Impact Study for the proposed reoccupation of the *Tech City Office Park* located in the Town of Ulster, Ulster County, New York. The project site, known as the East Campus of Tech City, is located in the south of US Route 209/NY Route 199 and east of Enterprise Drive. The project location is shown on Figure 1.1

A. Planned Project

The existing East Campus is an approximate 2,164,000 square-foot (SF) development consisting primarily of office and industrial space. The proposed development plan includes the demolition of approximately 290,000 SF of obsolete buildings, the reuse of 558,000 SF of two existing buildings for interior parking, the continued use of 1,318,000 SF of existing buildings, and the construction of approximately 645,000 SF of new buildings. Therefore, the building gross floor area of the new campus will be reduced to approximately 1,963,000 SF spread out over 5 parcels. Table 1.1 summarizes the development plan for the proposed project.

Table 1.1 – Development Plan

Land Use	Size					
	Parcel A	Parcel B	Parcel C	Parcel D	Parcel E	Total
Office		169,646 SF	302,446 SF			**472,092 SF**
Industrial/Flex				151,246 SF		**151,246 SF**
Warehousing	160,000 SF			422,914 SF		**582,914 SF**
Research & Development	160,000 SF			280,024 SF		**440,024 SF**
Residential			72-units (86,400 SF)		56-units (67,200 SF)	**128-units (153,600 SF)**
Recreational Community Center					29,728 SF	**29,728 SF**
Multi-plex Move Theater					10-screens (42,000 SF)	**42,000 SF**
Restaurant					12,000 SF	**12,000 SF**
Retail			43,200 SF		36,000 SF	**79,200 SF**
Total	**320,000 SF**	**169,646 SF**	**432,046**	**854,184 SF**	**186,928**	**1,962,804 SF**

A conceptual master plan dated January 27, 2009 included under Appendix A reflects the original proposed access plan into the site. This plan provided access via

three driveways on Old Neighborhood Road, three driveways on Enterprise Drive, and three driveways on Boices Lane. It is noted that the ceremonial drop-off loop for one-way entering and exiting traffic located in front of Parcel B on Enterprise Drive will remain open. It was agreed during the planning process that the northern most site driveway on Enterprise Drive should be limited to right-in/right-out only access. It was also determined that the westerly most site driveway on Boices Lane should be eliminated from the development plan and that the middle site driveway on Boices Lane should be re-aligned opposite an existing roadway. Some of the internal roadways are proposed to be converted to public roads. The revised conceptual master plan illustrates the proposed land uses, site access points, and future public streets bounded by the red right-of-way line.

B. Study Area and Methodology

The study area includes the following intersections, as per the scoping document adopted on April 16, 2009 by the Town as Lead Agency for SEQRA:

- Enterprise Drive/US Route 209 (NY Route 199) Westbound Ramps
- Enterprise Drive/US Route 209 (NY Route 199) Eastbound Ramps
- Enterprise Drive/Existing Site Driveways (3)
- Enterprise Drive/Loop Driveways (2)
- Enterprise Drive/Boices Lane
- Boices Lane/Site Driveways (2)
- Boices Lane/Morton Boulevard/East Driveway
- Boices Lane/John Clark Drive/Retail Driveway

It was agreed during the scoping process that the critical study area intersections would include those located on Enterprise Drive and Boices Lane and that the access provided from Neighborhood Road was incidental. The potential traffic impact of the proposed project was determined by documenting the existing traffic conditions in the area, projecting future traffic volumes, including the peak hour trip generation of the site, and determining the operating conditions of the study area intersections after development of the proposed project.

PROJECT LOCATION

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CME
CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 1.1

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CHAPTER II

EXISTING CONDITIONS

A. Roadways Serving the Site

- US Route 209/NY Route 199 – The US Route 209/NY Route 199 overlap is classified as a Rural Principal Arterial in the study area. US Route 209 provides east-west travel throughout the study area. Data published by the New York State Department of Transportation (NYSDOT) in the *2006 Highway Sufficiency Ratings* indicates that the pavement on US Route 209 is in good condition near the project site. The posted speed limit on US Route 209 is 55-mph near the project site.

- Enterprise Drive – Enterprise Drive, also known as Ulster County Road 157, is a county road that provides north-south travel along the western edge of the Tech City East Campus from US Route 209 to Boices Lane. Enterprise Drive divides the Tech City Campus into eastern and western halves with entirely commercial office space along the roadway. Enterprise Drive provides two 11-12 foot travel lanes in each direction, a raised center median, and shoulders varying in width from 1 foot to 10 feet. There is an 8-foot multi-use path along the eastern side of Enterprise Drive, and the posted speed limit is 40-mph.

- Boices Lane – Boices Lane, also known as Ulster County Road 157 east of its intersection with Enterprise Drive, is a county road that provides east-west travel in the Town of Ulster from Enterprise Drive to US Route 9W. Boices Lane borders the southern edge of the East Campus and provides two-way travel with two 11-foot westbound travel lanes and one 13-foot eastbound travel lane. Boices lane generally has 1-foot shoulders and a speed limit of 40-mph. Land use along Boices lane is primarily commercial, with a small number of residences.

B. Study Area Intersections

- Enterprise Drive/US Route 209(NY Route 199) Westbound Ramps – This intersection operates under free-flow conditions. The eastbound Route 209 westbound off ramp approach provides a one lane approach that continues as a second southbound lane on Enterprise Drive. The northbound Enterprise Drive approach provides one lane for through movements and one lane for right turns merging onto Route 209 westbound. The southbound Enterprise Drive approach provides one shared travel lane for through and left-turn movements.

- Enterprise Drive/US Route 209(NY Route 199) Eastbound Ramps – This intersection operates under actuated traffic signal control with a two phase signal cycle averaging 65 seconds. The eastbound Route 209 eastbound off

ramp approach splits into two lanes. The northerly split provides two lanes for left-turns only onto Enterprise Drive while the southerly split turns into a parallel one-way road southbound that intersects Enterprise Drive further south. The northbound Enterprise Drive approach provides two lanes for through movements and a separate right-turn slip lane. The southbound Enterprise Drive approach provides a lane for through movements and a shared left-turn/through lane.

- Enterprise Drive/North Driveway – This is a T-Intersection operating under stop-sign control. Enterprise drive is a divided highway at this point with a raised median separating northbound and southbound vehicles. The westbound North Driveway approach consists of an exclusive left-turn lane and a separate right-turn lane. The northbound Enterprise Drive approach consists of a through lane and a shared right-turn/through lane. The southbound Enterprise Drive approach consists of two through lanes and an exclusive left-turn lane. It is noted that this intersection was controlled by a traffic signal. However, existing traffic volumes no longer warrant traffic signal control and the signal heads are currently covered.

- Enterprise Drive/US Route 209 Westbound Off Ramp/Middle Driveway – This is a 4-way intersection operating under stop-sign control on the eastbound Route 209 off ramp approach and westbound Middle Driveway approach. The eastbound approach consists of a single lane for shared left-turn/through movements. A separate southbound through lane operates under yield control to Enterprise Drive approximately 200-feet to the south. The westbound Middle Driveway approach consists of a single lane for shared travel movements. The northbound Enterprise Drive approach consists of a through lane and a shared through/right-turn lane. The southbound Enterprise Drive approach consists of two through lanes. Left turns onto the Middle Driveway are prohibited. The aerial picture below shows the intersection geometry. It is noted that this intersection was controlled by a traffic signal. However, existing traffic volumes no longer warrant traffic signal control and the signal heads are currently covered.

- Enterprise Drive/Loop Driveways – This section of Enterprise Drive consists of two lanes in both the northbound and southbound directions. The loop driveways provide one-way counter-clockwise circulation and allow vehicles to turn to and from the driveways in all directions. The aerial picture below shows the intersection geometry.

- Enterprise Drive/West Campus Driveway/South Driveway – This is a 4-way intersection operating under actuated traffic signal control with a two phase

signal cycle averaging 90 seconds. The eastbound West Campus Driveway approach consists of a shared left-turn/through lane and a separate right-turn lane. The westbound South Driveway approach consists of a single lane for shared travel movements. The northbound Enterprise Drive approach consists of a through lane and a shared through/right-turn lane. Left-turns are prohibited on the northbound approach. The southbound Enterprise Drive approach consists of a shared through/right-turn lane, a through lane and an exclusive left-turn lane.

- Enterprise Drive/Boices Lane – This is a 4-way intersection operating under actuated traffic signal control with a four phase signal cycle averaging 90 seconds. The eastbound Boices Lane approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The westbound Boices Lane approach consists of a shared left-turn/through lane and a continuous right-turn slip lane. The northbound Mountain View Court approach consists of a single lane for shared travel movements. The southbound Enterprise Drive approach consists of a shared through/right-turn lane and an exclusive left-turn lane.

- Boices Lane/West Driveway – This is a T-intersection with the driveway operating under stop-sign control on the southbound approach. The eastbound Boices Lane approach consists of a single lane for shared travel movements. The westbound Boices Lane approach consists of a through lane and a shared through/right-turn lane. The southbound West Driveway approach consists of a single lane for shared left and right turn movements. Traffic is currently restricted from using the western driveway and it is blocked off.

- Boices Lane/Middle Driveway – This is a T-intersection with the driveway operating under stop-sign control on the southbound approach. The eastbound Boices Lane approach consists of a single lane for shared travel movements. The westbound Boices Lane approach consists of a through lane and a shared through/right-turn lane. The southbound Middle Driveway approach consists of a single lane for shared left and right turn movements. Traffic is currently restricted from using the Middle driveway and it is blocked off. It is noted that this intersection was controlled by a traffic signal. However, existing traffic volumes no longer warrant traffic signal control and the signal heads are currently covered.

- Boices Lane/Morton Boulevard/East Driveway – This is a 4-way intersection operating under pre-timed traffic signal control with a four phase signal cycle averaging 75 seconds. The eastbound Boices Lane approach consists of a shared left-turn/through lane and a separate right-turn lane. The westbound Boices Lane approach consists of an exclusive left-turn lane, a through lane, and a separate right-turn lane. The northbound Morton Boulevard approach consists of a shared left-turn/through lane and a separate right-turn lane. The

southbound East Driveway approach consists of an exclusive left-turn lane and a shared through/right-turn lane. The pavement markings on the southbound approach are faded and the driveway has very limited use.

- Boices Lane/John Clark Drive/Retail Driveway – This is a 4-way intersection operating under actuated traffic signal control with a two phase signal cycle averaging 75 seconds. The eastbound Boices Lane approach consists of a shared left-turn/through lane and a shared through/right-turn lane. The westbound Boices Lane approach consists of a shared left-turn/through lane and a separate right-turn lane. The northbound Retail Driveway approach and the southbound John Clark Drive approach consist of a shared left-turn/through lane and a separate right-turn lane.

C. Existing Conditions

Intersection turning movement traffic counts were conducted at the study area intersections on Thursday, April 23, 2009, Tuesday, April 28, 2009, and Wednesday, May 6, 2009 during the afternoon peak commuter period from 4:00 to 6:00 p.m. The raw traffic volumes are included in Appendix B. These peak hour traffic counts were balanced where appropriate and provide existing traffic conditions at the study area intersections as summarized on Figure 2.1, and form the basis for all traffic forecasts.

Automatic traffic recorders (ATRs) were installed on Enterprise Drive and Boices Lane to record hourly traffic volumes from Tuesday, April 28, 2009 through Wednesday, May 6, 2009. The raw ATR data is included in Appendix C.

The following observations are evident based on the existing traffic volume data:

- The PM peak hour generally occurred from 4:30 to 5:30 p.m.

- The weekday PM peak hour is the highest traffic volume time period and is the appropriate design hour for this study. Traffic volumes during the weekday AM and weekend mid-day peak hours are less.

- The two-way traffic volume on Enterprise Drive adjacent to the project site is approximately 1,390 vehicles during the PM peak hour. The two-way traffic volume on Boices Lane adjacent to the project site is approximately 1,400 vehicles during the PM peak hour.

- Heavy vehicles on Enterprise Drive account for approximately 1 percent of two-way traffic adjacent to the project site during the PM peak hour.

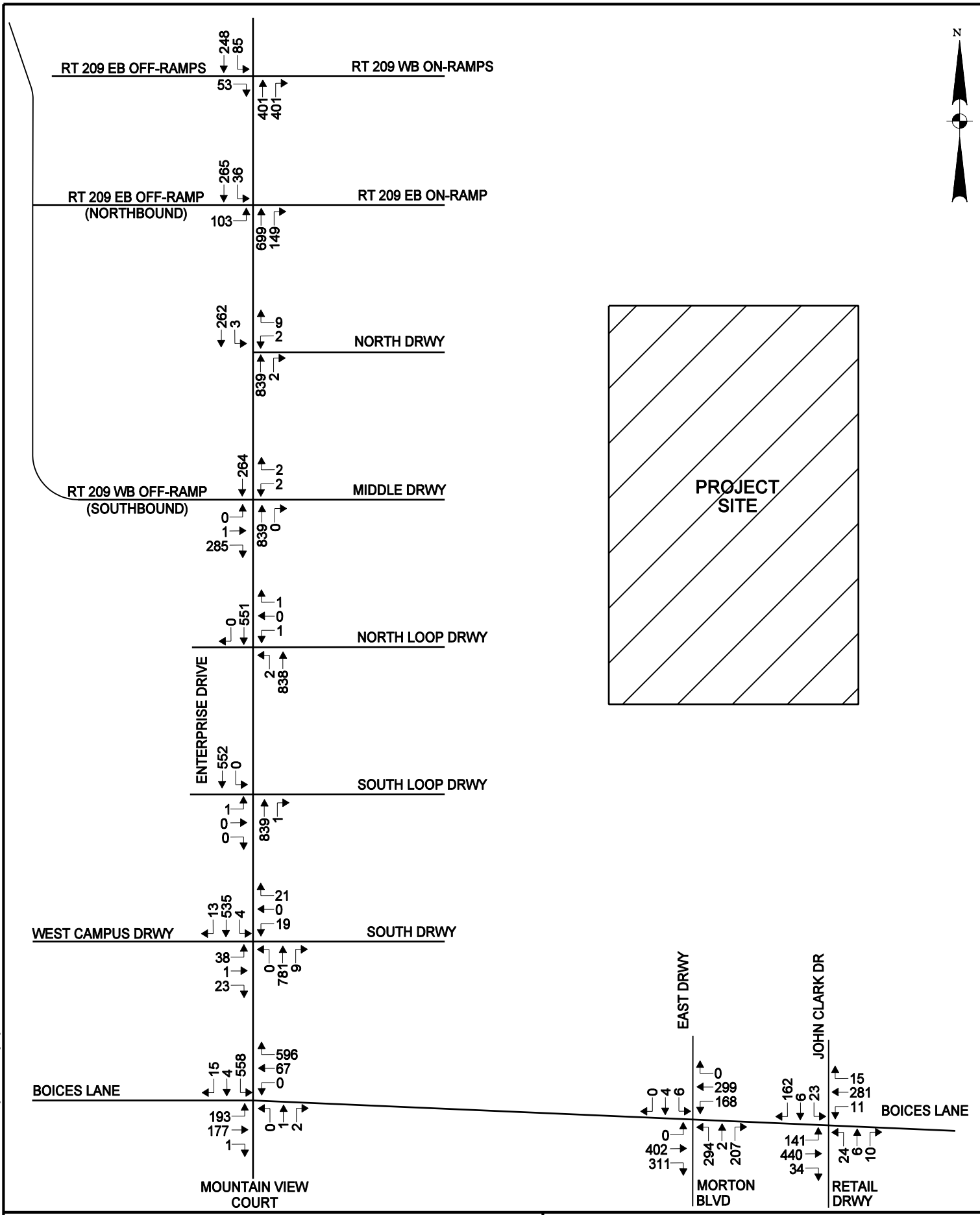
- Heavy vehicles on Boices Lane account for less than 1 percent of two-way traffic adjacent to the project site during the PM peak hour.

D. Transit

The primary regional transit service provider that operates in the project area is the Ulster County Area Transit (UCAT). The closest UCAT bus route provides year round service and is called the SUNY Ulster-Kingston-Mall Area line that travels from the SUNY Ulster Campus in the Town of Marbletown to the shopping area on Route 9W in the Town of Ulster located just south of NY Route 199. No service is provided on weekends or on holidays. It is noted that while there are no fixed bus stops in the project area, this line will travel to the existing Tech City Campus on request only.

E. Pedestrian/Bicycle Accommodations and Environment

A review of the existing road network indicates that a multi-use path is provided on the south and west side of the existing campus located on the north side of Boices Lane starting at the Morton Boulevard intersection and on the east side of Enterprise Drive ending at the Route 209 ramps. Actual pedestrian and bicycle counts conducted at the study area intersections indicate that pedestrian and bicycle traffic is fairly sparse during the PM peak hour and that existing joggers, walkers, and bicyclists use either the available shoulders or multi-use path.



2009 EXISTING TRAFFIC VOLUMES PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER, ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 2.1

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CHAPTER III
TRAFFIC FORECASTS

To evaluate the impact of the proposed development, traffic projections were prepared for a 2014 and 2029 Build year (5 and 20 year build-out) and a comparison was made between the future traffic volumes with and without the project. Table 3.1 describes the various traffic forecasts contained at the end of this chapter.

Table 3.1 – Summary of Peak Hour Traffic Projections

Figure Description	Figure Number
2014 No-Build Traffic Volumes – PM Peak Hour	Figure 3.1
2029 No-Build Traffic Volumes – PM Peak Hour	Figure 3.2
Trip Distribution – Primary	Figure 3.3
Trip Distribution – Pass-By	Figure 3.4
Trip Assignment – Primary	Figure 3.5
Trip Assignment – Pass-By	Figure 3.6
2014 Build Traffic Volumes – PM Peak Hour	Figure 3.7
2029 Build Traffic Volumes – PM Peak Hour	Figure 3.8

A. No-Build Traffic Volumes

The 2014 and 2029 No-Build traffic volumes are based on an analysis of existing traffic growth trends, other developments in the project area, and discussions with the Ulster County Transportation Council (UCTC). Historical traffic volume data found in the *2007 Traffic Data Reports,* published by the New York State Department of Transportation (NYSDOT), indicates that traffic volumes in the vicinity of the site have been increasing by approximately one percent per year over the last several years. Therefore, a growth rate of one percent per year was applied for to the 2009 existing traffic volumes to calculate the 2014 and 2029 background growth.

The Town of Ulster provided information regarding additional development projects within the study area. Background traffic from the following projects was included in the calculation of the No-Build volumes:

- Olive Garden – 7,500 SF
- White Castle – 2,500 SF
- Ulster Manor – 128 Townhouses

- O2 Day Spa – 4,186 SF
- Shop Rite Plaza Redevelopment – 69,371 SF

Trips associated with these projects were distributed to the study area intersections as shown on Figure D.1 in Appendix D. The trips associated with these other developments were added to the background traffic volumes to develop the 2014 and 2029 No-Build traffic volumes. The 2014 and 2029 No-Build traffic volumes which include a general growth rate and volumes from the other development projects are illustrated on Figure 3.1 and Figure 3.2. The No-Build volumes represent the traffic conditions expected at the study area intersection before re-development of the proposed *Tech City Office Park*.

B. Trip Generation

Trip generation determines the quantity of traffic expected to travel to/from the site. The Institute of Transportation Engineers (ITE) *Trip Generation, 7th edition*, provides trip generation data for various land uses based on studies of similar existing developments located across the country. The trips for the proposed development were estimated using ITE land use code (LUC) 710 for General Office, LUC 760 for Research & Development, LUC 110 for General Light Industrial, LUC 150 for Warehousing, LUC 220 for Apartments, LUC 495 for Recreational Community Center, LUC 445 for Multi-plex Movie Theater, LUC 932 for High-Turnover (Sit-Down) Restaurant, and LUC 814 for Specialty Retail.

It can be expected that some trips to the proposed project will originate from traffic that is already passing the site on Enterprise Drive and Boices Lane. Pass-by trips are vehicles that will stop at the site before continuing on to their primary destination. For example, a westbound trip on Boices Lane leaving work may stop at the restaurant and then continue westbound towards home. This type of trip would be considered a pass-by trip. The percentage of pass-by trips applied to the different land uses is based on a review of data provided by ITE. The data shows that the average percentage of pass-by trips for high turn-over sit-down restaurants of a similar size is 43 percent. Based upon this information, a 40 percent pass-by percentage was applied to trips generated by the proposed restaurant land uses.

It can also be expected that some of the traffic coming to the campus will stop at more than one location. These trips are referred to as multi-use trips and are described as trips that use one or more land uses in the same area. For example, an employee of one of the office buildings could go to the movies after work before heading home to one of the residences located internally. These trips are referred to as multi-use trips and are described as trips that use one or more land uses in the same area. The *Multi-Use Development Trip Generation and Internal Capture Summary* table provided by ITE (located under Appendix E) shows the potential internal capture rate for the PM peak hour for all land uses. Based on this table, it was calculated to apply an overall 6 percent internal capture rate to each of the land uses to account for these types of trips. The peak hour trip generation estimate is summarized in Table 3.2.

Table 3.2 – Trip Generation Summary

Parcel	Land Use	Size	Land Use Code	PM Peak Hour		
				Enter	Exit	Total
A	Research & Development Space	160,000 SF	760	24	135	159
	Warehousing	160,000 SF	150	13	38	51
B	Office Space	169,646 SF	710	37	181	218
C	Office Space	302,446 SF	710	66	324	390
	Retail Space	43,200 SF	814	51	65	116
	Apartments	72-units (86,400 SF)	220	33	18	51
D	Light Industrial	151,246 SF	110	7	52	59
	Warehousing	422,914 SF	150	33	100	133
	Research & Development Space	280,024 SF	760	42	237	279
E	Apartments	56-units (67,200 SF)	220	24	13	37
	Recreational Community Center	29,728 SF	495	24	41	65
	Multiplex Movie Theater	10-screens (42,000 SF)	445	61	75	136
	Restaurant	12,000 SF	932	82	52	134
	Retail Space	36,000 SF	814	42	54	96
Total Trips		1,962,804 SF		539	1,385	1,924
Multi-Use Credit = 6%				-58	-58	-116
Total Trips – Multi-Use				481	1,327	1,808
Pass-by = 40% of Restaurant Trips				-25	-25	-50
Total New Trips				**456**	**1,302**	**1,758**

Accounting for pass-by and multi-use trips, the *Tech City Office Park* will generate a total of 1,758 new vehicle trips during the PM peak hour with 456 trips entering and 1,302 trips exiting. The total number of trips expected at the driveways to

the site is the sum of the primary trips and pass-by trips (481 entering trips, 1,327 exiting trips, and 1,808 total trips).

C. Trip Distribution

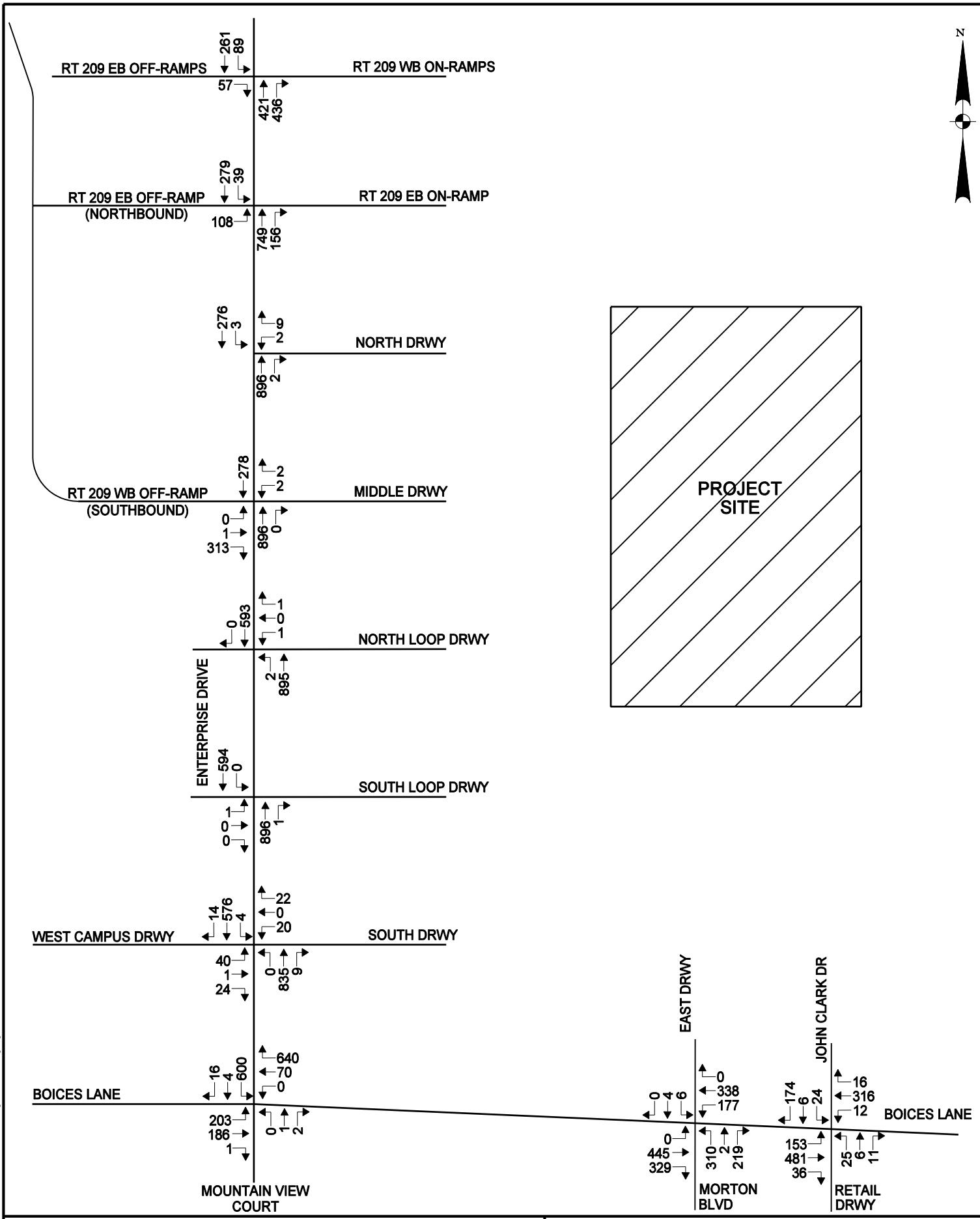
Trip distribution describes where traffic originates or where traffic is destined. Traffic generated by the proposed project was distributed based on existing travel patterns, the layout of the site and the locations of the proposed driveways, and the locations of population centers and major travel routes in the region. In general, it is expected that approximately 40 percent of the site generated traffic will travel to and from the site via Route 9 northbound and southbound. Approximately 25 percent of the site generated traffic is expected to travel to and from the west via Route 209 while approximately 10 percent of the site generated traffic will travel to and from the east on NY Route 199. The remaining 25 percent of site generated traffic will be split between Neighborhood Road to the north, Morton Boulevard to the south, and John Clark Drive to the east. The trip distribution pattern for primary tips to the development is shown on Figure 3.3 while the pass-by trip distribution is shown on Figure 3.4.

D. Trip Assignment

Trip assignment combines the results of the trip generation and trip distribution and determines the specific paths and roadways that will be used between various origin/destination pairs. Figure 3.5 shows the resulting primary trip assignment for project development while Figure 3.6 shows the pass-by trip assignment.

E. Build Traffic Volumes

The results of the site generated traffic assignment were added to the appropriate No-Build traffic volumes to develop the Build traffic volumes. The 2014 and 2029 Build traffic volumes are shown on Figure 3.7 and Figure 3.8.



2014 NO-BUILD TRAFFIC VOLUMES PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.1

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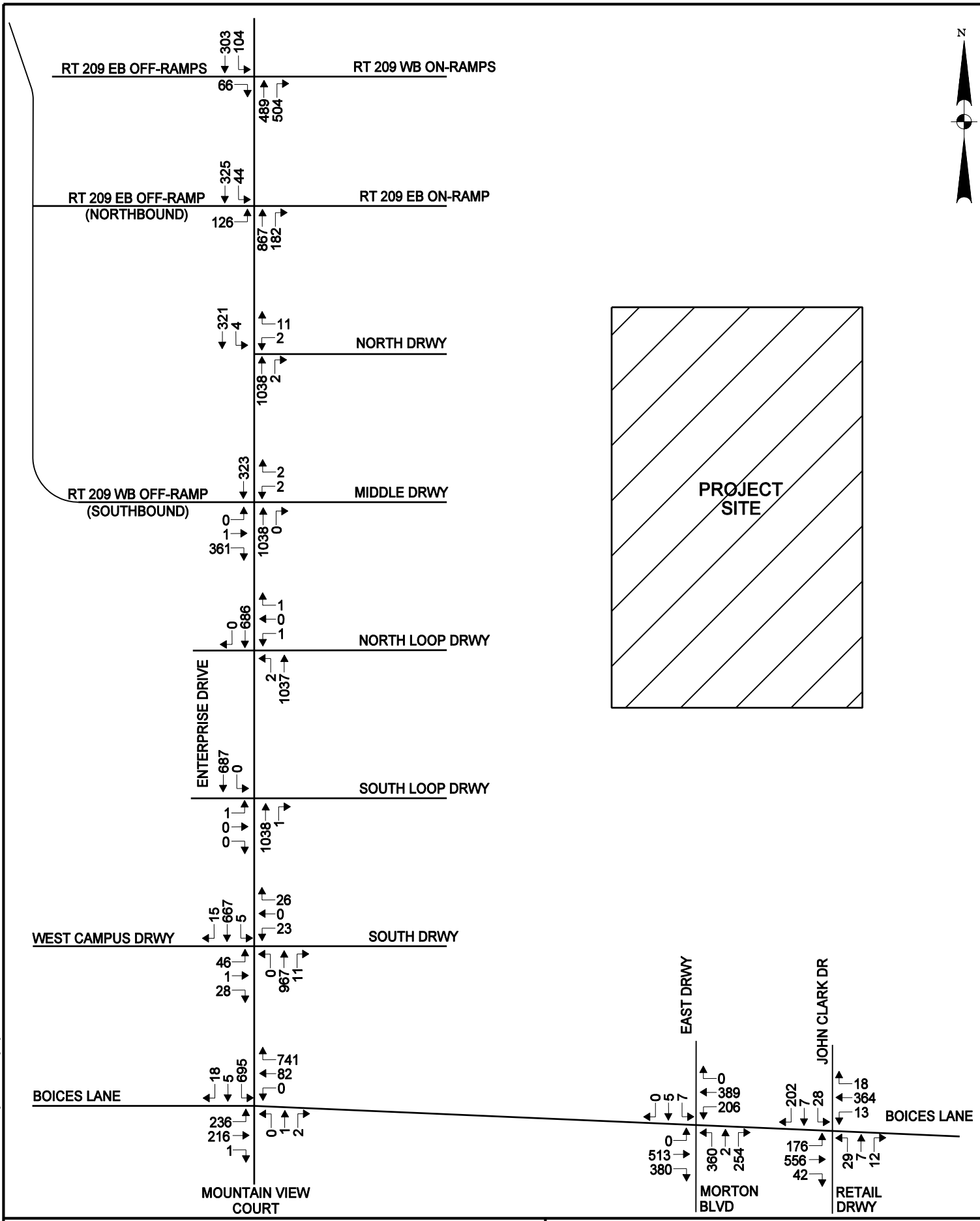

2029 NO-BUILD
TRAFFIC VOLUMES
PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CME
CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.2

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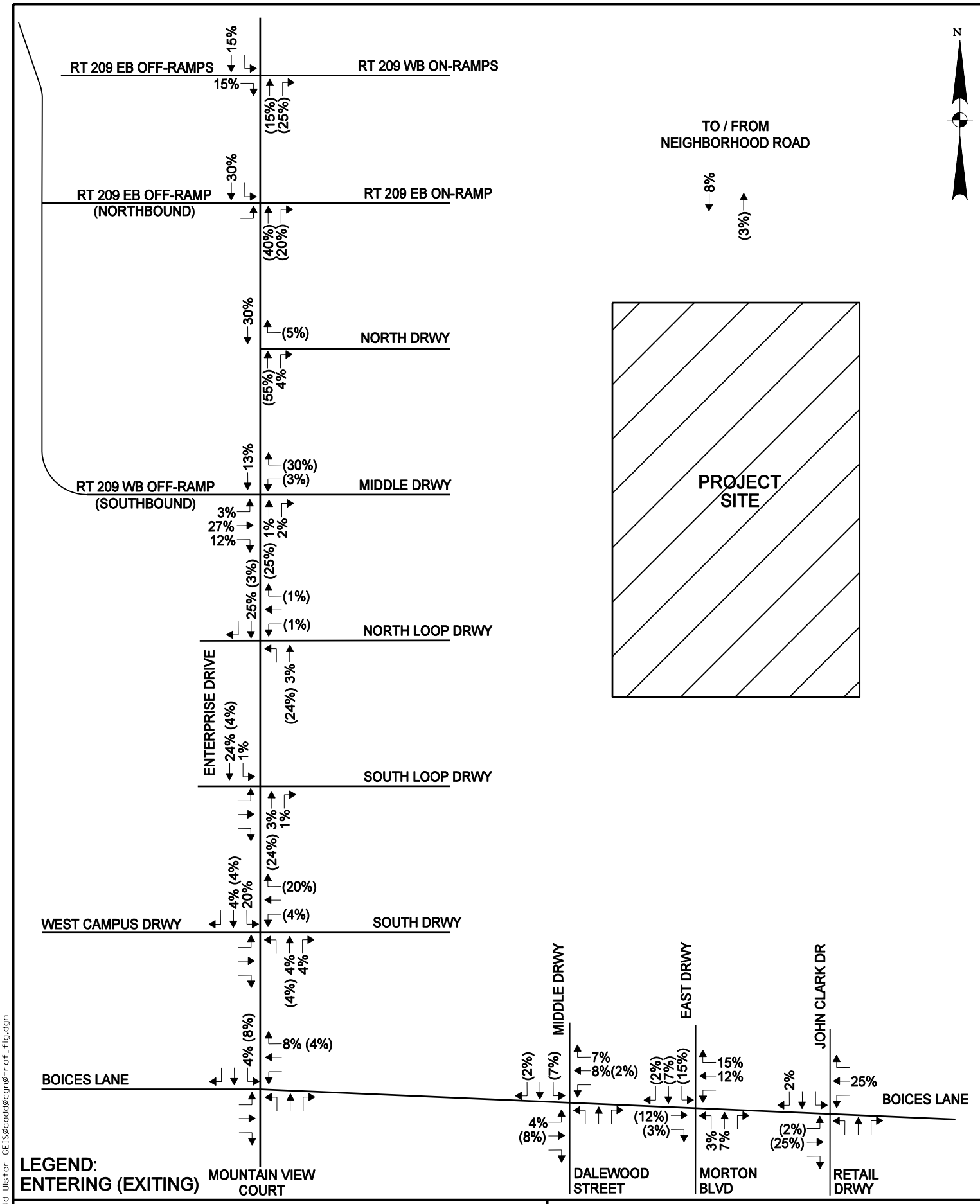

TRIP DISTRIBUTION

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.3

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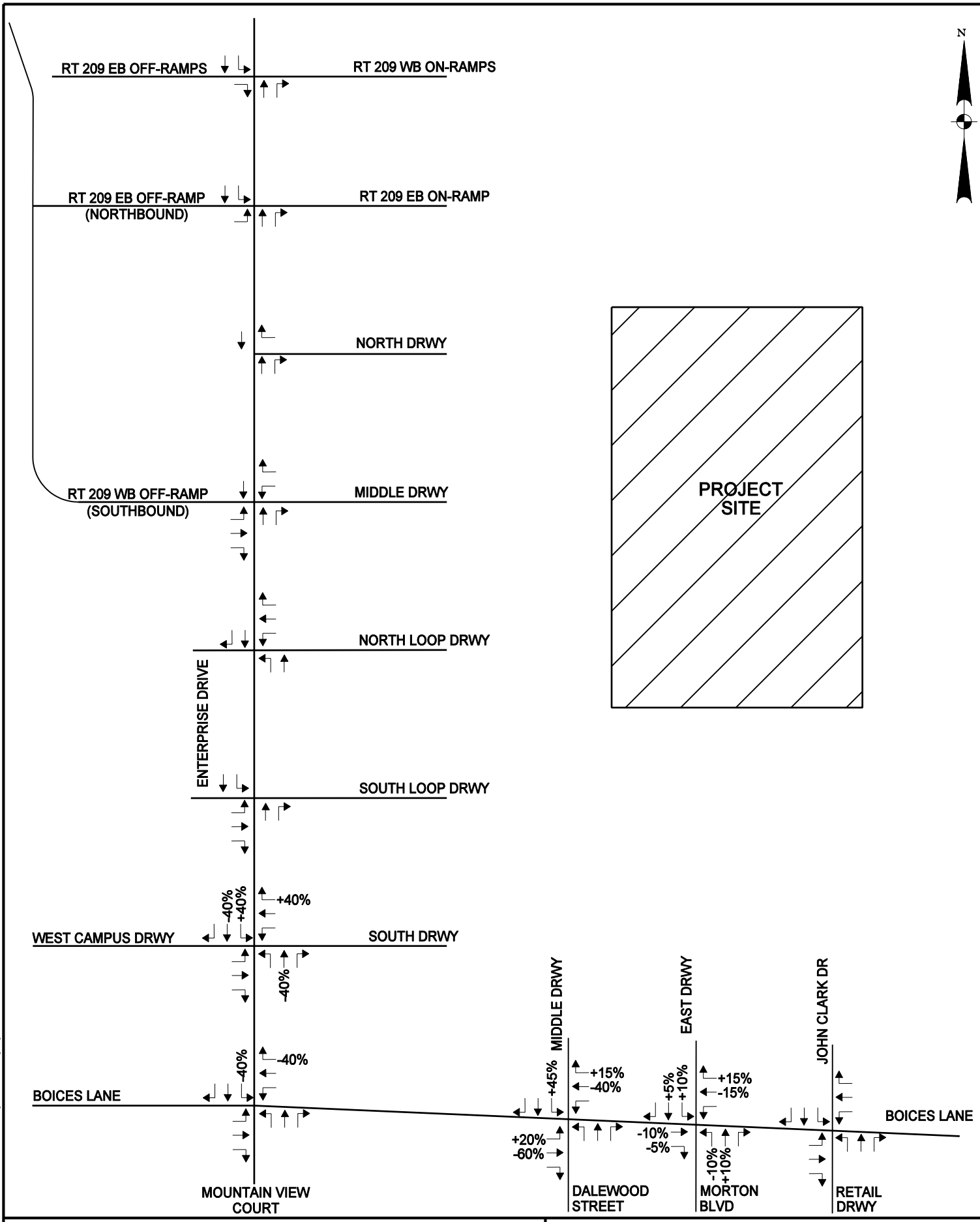
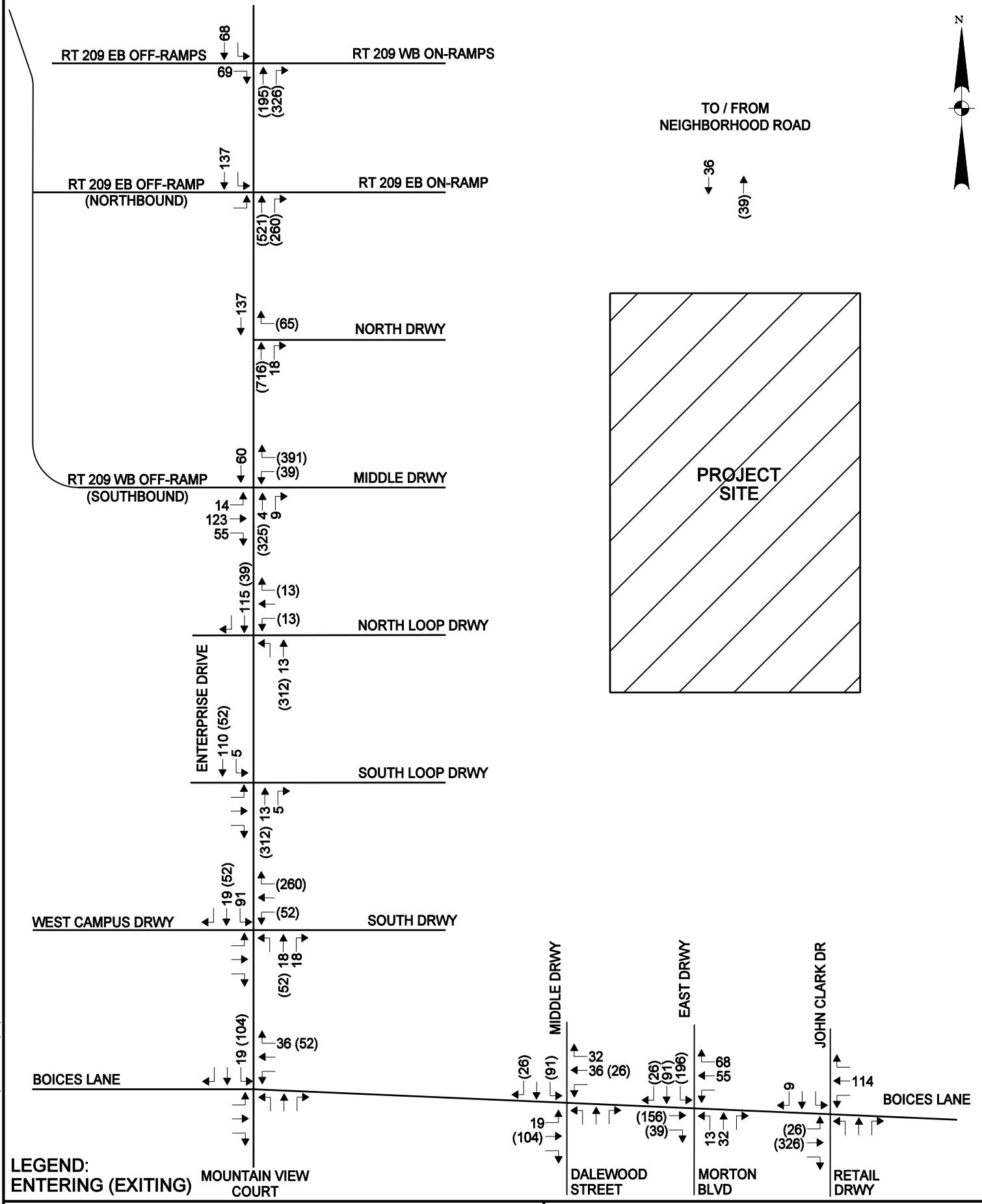


PASS-BY TRIP DISTRIBUTION

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.4



TRIP ASSIGNMENT
PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d | DATE: 9/09 | FIGURE: 3.5

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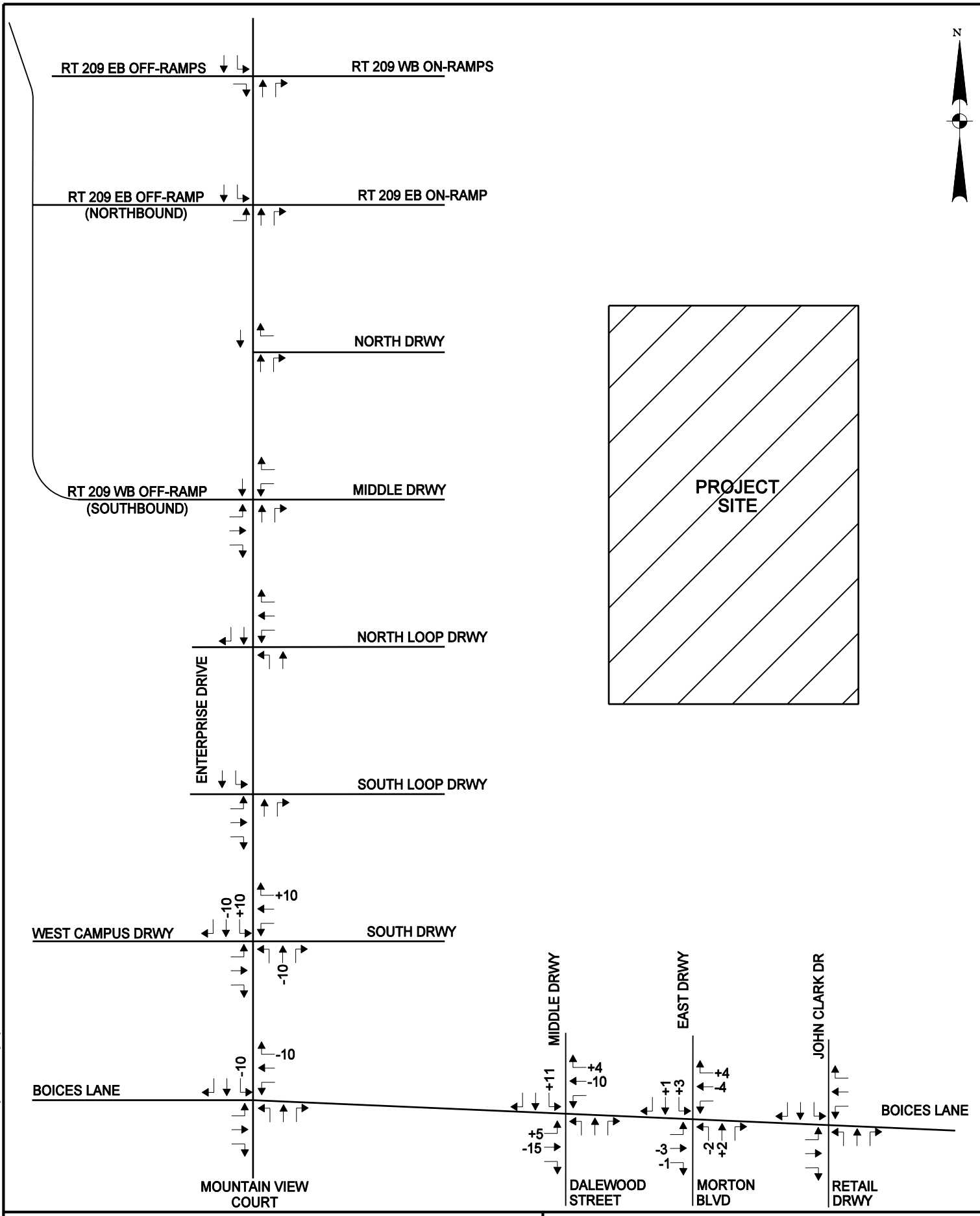

PASS-BY TRIP ASSIGNMENT
PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.6

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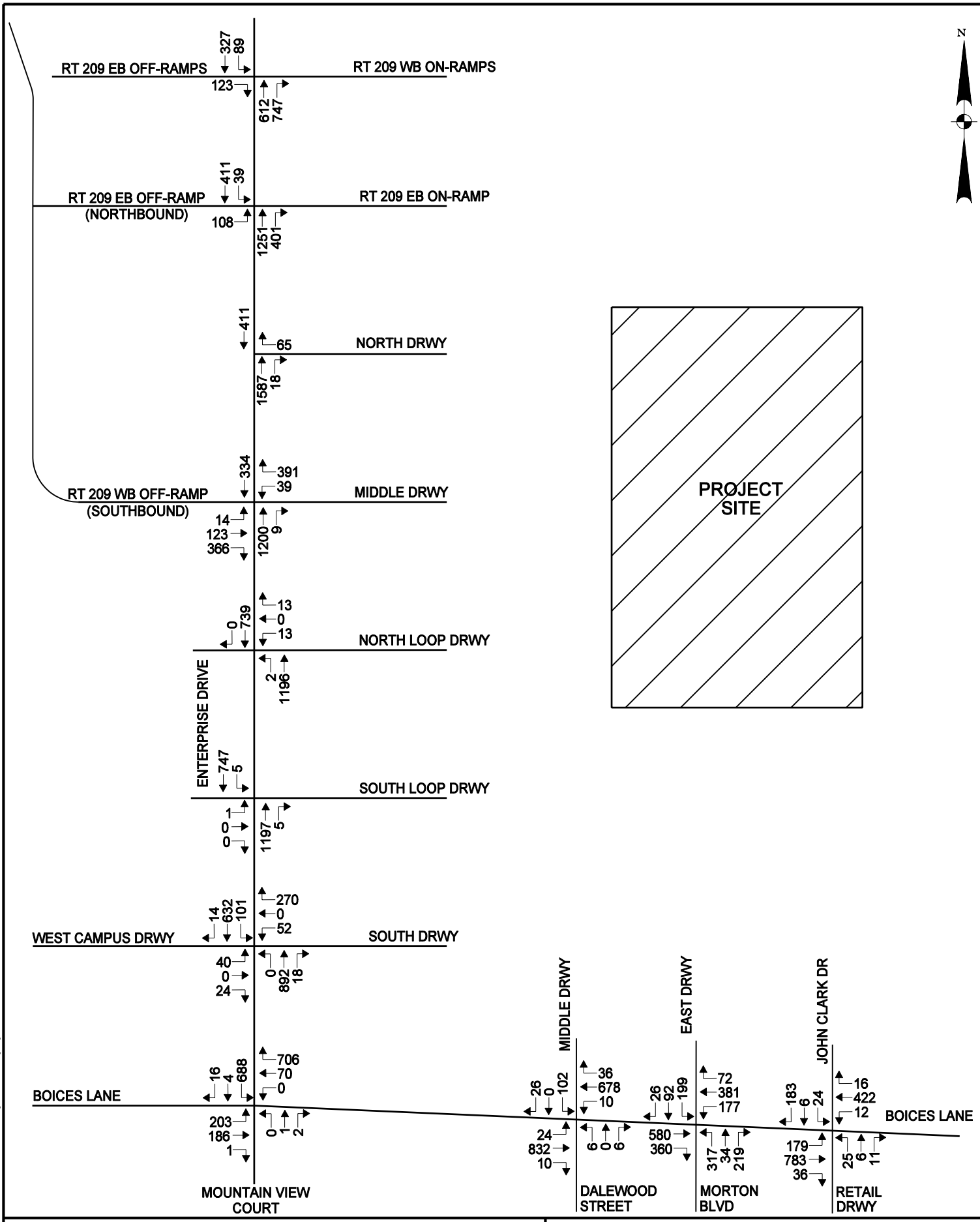

2014 BUILD TRAFFIC VOLUMES PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER, ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.7

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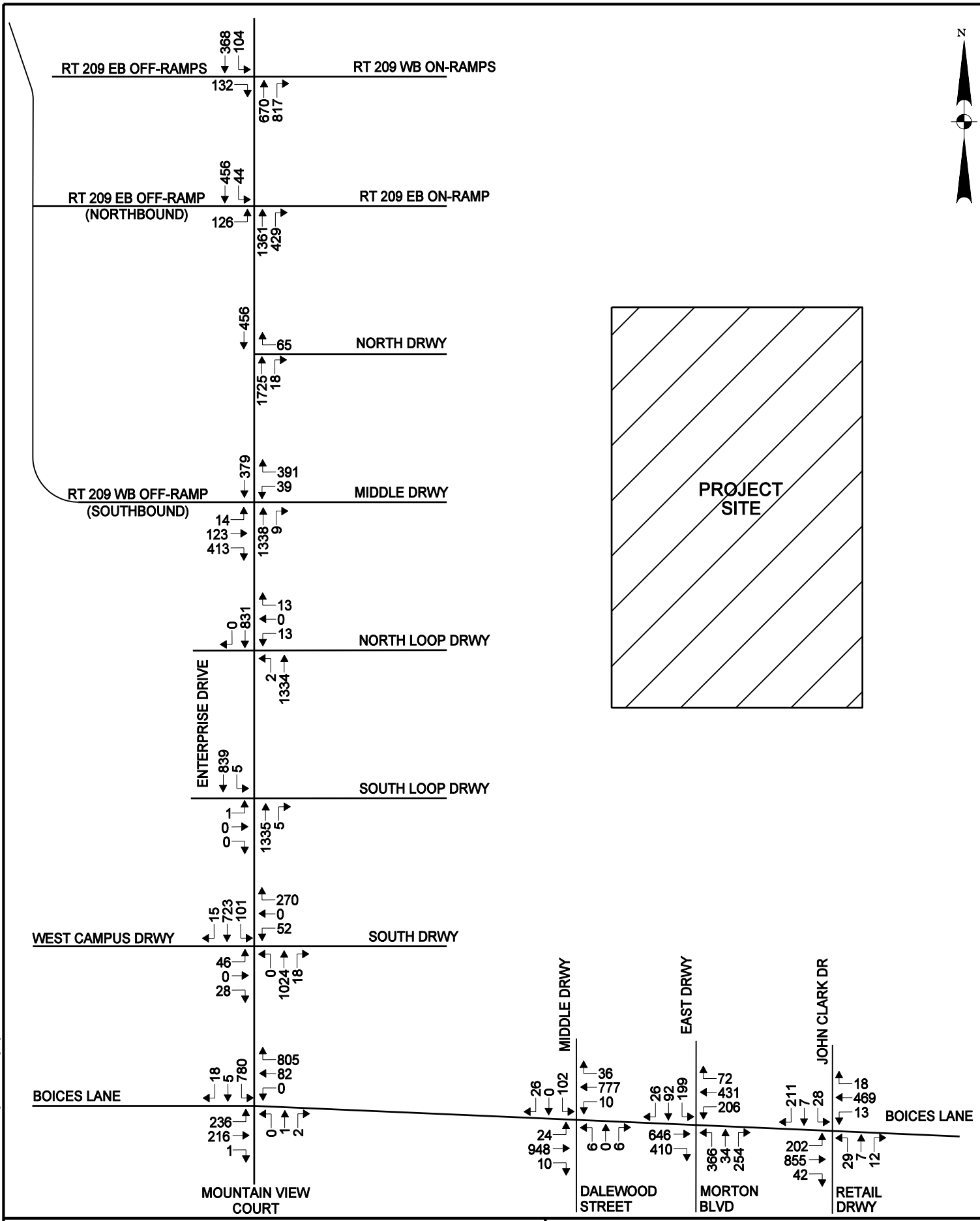

2029 BUILD TRAFFIC VOLUMES PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER, ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: 3.8

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CHAPTER IV
ANALYSIS

A. Capacity/Level of Service Analysis

Intersection Level of Service (LOS) and capacity analysis relate traffic volumes to the physical characteristics of an intersection. Intersection evaluations were made using the Synchro Software (version 6.14) and Highway Capacity Software (HCS+ version 5.3) which automate the procedures contained in the *2000 Highway Capacity Manual*. Levels of service range from A to F with level of service A conditions considered excellent with very little delay while level of service F generally represents conditions with very long delays. Further detailed information about levels of service criteria is included in Appendix F.

The relative impact of the proposed project can be determined by comparing the level of service during the 2014 and 2029 design years for the No-Build and Build traffic volume conditions. Table 4.1 shows the results of the Level of Service calculations.

Table 4.1 – Level of Service Summary

Intersection			Control	PM Peak Hour						
				2009 Existing	2014 Design Year			2029 Design Year		
					No-Build	Build	Build w/ Imp	No-Build	Build	Build w/ Imp
1	Enterprise Dr/US Route 209/ NY Route 199 WB Ramps		TW							
	Enterprise Dr SB	LT		A (8.6)	A (8.7)	A (9.6)	--	A (9.1)	B (10.1)	--
2	Enterprise Dr/US Route 209/NY Route 199 EB Ramps		S							
	Route 209 EB	LL		B (18.0)	B (18.3)	C (25.1)	--	B (16.5)	C (24.1)	--
	Enterprise Dr NB	TT		A (4.2)	A (4.2)	A (4.5)	--	A (4.5)	A (4.9)	--
	Enterprise Dr SB	LTT		A (3.5)	A (3.5)	A (2.9)	--	A (3.6)	A (3.0)	--
		Overall		A (5.3)	A (5.3)	A (5.4)	--	A (5.4)	A (5.7)	--
3	Enterprise Dr/North Drwy		TW							
	Enterprise DR SB	L		B (12.8)	B (13.4)	--	--	C (15.2)	--	--
	North Drwy WB	L		D (27.9)	D (31.1)	--	--	E (41.8)	--	--
		R		--	--	C (19.4)	--	--	C (22.3)	--
4	Enterprise Dr/US Route 209 EB Off Ramp/Middle Drwy		TW							
	Route 209 EB Off EB	LT		D (31.2)	D (34.9)	F (>999)	--	E (48.8)	F (>999)	--
		R		B (11.7)	B (12.3)	B (14.7)	--	B (13.8)	C (17.5)	--
	Middle Drwy WB	LR		D (31.9)	E (36.4)	F (>999)	--	F (53.0)	F (>999)	--
	Route 209 EB Off EB	LT	S	--	--	--	B (17.3)	--	--	B (19.2)
		R		--	--	--	A (7.5)	--	--	B (13.2)
	Middle Drwy WB	L		--	--	--	B (17.1)	--	--	B (19.1)
		R		--	--	--	C (29.9)	--	--	C (34.2)
	Enterprise Dr NB	TTR		--	--	--	B (15.3)	--	--	B (19.3)
	Enterprise Dr SB	TT		--	--	--	A (7.8)	--	--	A (8.2)
		Overall		--	--	--	B (15.6)	--	--	B (19.0)
5	Enterprise Dr/North Loop Drwy		TW							
	Enterprise Dr NB	LTT		A (0.1)	A (0.1)	A (0.1)	A (9.4)	A (0.1)	A (0.1)	A (9.8)
	North Loop Drwy WB	LTR		D (27.6)	D (31.7)	F (146.2)	F (122.2)	E (46.9)	F (382.4)	F (262.3)
6	Enterprise Dr/South Loop Drwy		TW							
	Enterprise Dr SB	LTT		A (0.0)	A (0.0)	A (0.6)	--	A (0.0)	A (0.7)	--
		[L]		--	--	--	C (15.0)	--	--	C (17.8)
	South Loop Drwy EB	LTR		D (28.2)	D (32.0)	F (64.6)	F (64.3)	E (44.6)	F (100.5)	F (99.7)
7	Enterprise Dr/West Campus Drwy /South Drwy		S							
	West Campus Drwy EB	LT		C (20.5)	C (21.3)	B (12.8)	B (17.7)	C (21.0)	B (15.9)	C (21.0)
		R		B (18.9)	B (19.4)	B (11.2)	B (16.6)	B (18.7)	B (13.2)	B (19.6)
	South Drwy WB	LTR		B (19.7)	C (20.4)	B (14.0)	--	B (19.8)	B (18.0)	--
		[LT]		--	--	--	B (17.3)	--	--	C (20.4)
		[R]		--	--	--	B (19.6)	--	--	C (24.0)
	Enterprise Dr NB	TTR		A (3.9)	A (3.9)	A (8.9)	B (15.0)	A (4.1)	A (9.0)	C (20.4)
	Enterprise Dr SB	L		A (2.9)	A (2.8)	B (17.1)	B (14.6)	A (2.8)	C (26.8)	D (37.7)
		TTR		A (3.5)	A (3.5)	A (7.8)	A (9.4)	A (3.6)	A (7.6)	B (12.3)
		Overall		A (5.6)	A (5.6)	A (9.9)	B (14.0)	A (5.8)	B (10.9)	B (19.0)
8	Enterprise Dr/Boices Ln/ Mountain View Ct		S							
	Boices Ln EB	L		D (39.6)	D (52.9)	E (65.8)	D (55.0)	F (113.3)	F (138.6)	D (51.5)
		TR		B (19.2)	C (20.4)	C (22.6)	D (37.9)	C (25.7)	C (29.3)	D (42.9)
	Boices Ln WB	LT		C (30.2)	C (31.0)	C (33.2)	C (29.1)	C (32.8)	D (35.0)	D (49.2)
		R		A (0.5)	A (0.6)	A (0.7)	A (0.7)	A (0.8)	A (0.9)	A (0.9)
	Mountain View Ct NB	LTR		C (31.1)	C (31.7)	C (33.3)	C (34.9)	D (35.1)	D (37.1)	D (44.6)
	Enterprise Dr SB	L		B (19.5)	C (21.1)	C (26.4)	C (22.0)	C (27.1)	C (34.7)	D (36.2)
		TR		B (10.1)	A (10.0)	A (9.6)	A (1.8)	A (10.0)	A (9.6)	A (1.6)
		Overall		B (17.3)	C (20.3)	C (23.9)	C (22.8)	C (33.6)	D (39.7)	C (28.4)

Key: TW, AW, S, R = Two-way stop, All-way stop, Signal, or Roundabout controlled intersection
NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound intersection approaches
L, T, R = Left-turn, through, and/or right-turn movements
L[T]R = LR represents the existing geometry, LTR represents the future geometry
X (Y.Y) = Level of Service (Average delay in seconds per vehicle)
-- = Not applicable

Table 4.1 – Level of Service Summary (Continued)

Intersection			Control	PM Peak Hour						
				2009 Existing	2014 Design Year			2029 Design Year		
					No-Build	Build	Build w/ Imp	No-Build	Build	Build w/ Imp
9	Boices Ln/Middle Drwy/ Dalewood St		TW							
	Boices Ln EB	L		--	--	A (0.9)	--	--	A (1.1)	--
	Boices Ln WB	L		--	--	A (0.5)	--	--	A (0.5)	--
	Dale wood St NB	LTR		--	--	D (33.2)	--	--	E (43.9)	--
	Middle Drwy SB	LTR		--	--	F (745.5)	--	--	F (>999)	--
	Boices Ln EB	LTR	S	--	--	--	A (7.8)	--	--	A (9.7)
	Boices Ln WB	LTTR		--	--	--	A (3.8)	--	--	A (3.8)
	Dale wood St NB	LTR		--	--	--	C (21.2)	--	--	C (23.8)
	Middle Drwy SB	LTR		--	--	--	C (26.3)	--	--	C (30.7)
		Overall		--	--	--	A (7.7)	--	--	A (8.9)
10	Boices Ln/Morton Blvd/East Drwy		S							
	Boices Ln EB	LT		D (38.6)	D (52.6)	F (124.9)	--	F (95.1)	F (182.7)	--
		[TT]		--	--	--	C (25.4)	--	--	C (28.8)
		R		A (8.6)	A (8.7)	B (13.7)	C (20.1)	A (8.8)	B (14.5)	C (21.0)
	Boices Ln WB	L		B (15.4)	B (17.9)	B (18.2)	B (16.1)	C (24.9)	D (38.5)	D (35.4)
		T		B (10.9)	B (11.5)	B (10.7)	B (14.0)	B (12.6)	B (11.3)	B (18.9)
		R		A (0.0)	A (0.0)	A (8.0)	A (7.3)	A (0.0)	A (8.0)	C (20.5)
	Morton Blvd NB	LT		C (22.3)	C (23.8)	F (160.5)	--	C (28.4)	F (230.3)	--
		R		A (9.6)	B (10.2)	B (11.1)	--	B (10.8)	B (11.5)	--
		[L]		--	--	--	B (18.8)	--	--	C (22.2)
		[TR]		--	--	--	C (27.0)	--	--	C (27.2)
	East Drwy SB	L		C (31.8)	C (32.9)	F (777.6)	C (21.4)	C (34.5)	F (879.6)	C (21.6)
		TR		C (30.9)	C (31.9)	D (35.1)	D (44.4)	C (33.3)	D (37.0)	D (47.9)
		Overall		B (19.8)	C (24.2)	F (155.3)	C (21.6)	D (36.9)	F (182.7)	C (25.6)
11	Boices Ln/John Clark Dr/ Plaza Drwy		S							
	Boices Ln EB	LTTR		A (4.5)	A (4.7)	A (5.1)	A (4.6)	A (4.9)	A (6.1)	A (4.2)
	Boices Ln WB	LT		A (4.3)	A (4.4)	A (3.9)	--	A (4.4)	A (3.9)	--
		R		A (3.4)	A (3.3)	A (2.6)	--	A (3.2)	A (2.5)	--
		[LTTR]		--	--	--	A (2.9)	--	--	A (6.9)
	Retail Drwy NB	LT		B (14.2)	B (14.9)	B (19.6)	C (27.7)	B (15.7)	C (21.5)	C (30.7)
		R		B (13.5)	B (14.1)	B (18.5)	C (26.0)	B (14.7)	B (20.0)	C (27.9)
	John Clark Dr SB	LT		B (14.0)	B (14.6)	B (19.2)	C (27.1)	B (15.4)	C (21.0)	C (29.6)
		R		B (13.9)	B (14.5)	B (18.9)	C (26.6)	B (15.2)	C (20.5)	C (22.1)
		Overall		A (6.5)	A (6.6)	A (7.0)	A (7.6)	A (6.9)	A (7.9)	A (8.3)

Key: TW, AW, S, R = Two-way stop, All-way stop, Signal, or Roundabout controlled intersection
NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound intersection approaches
L, T, R = Left-turn, through, and/or right-turn movements
L[T]R = LR represents the existing geometry, LTR represents the future geometry
X (Y.Y) = Level of Service (Average delay in seconds per vehicle)
-- = Not applicable

The following observations are evident from this analysis. A summary of the proposed improvements is shown on Figure 4.1:

1) Enterprise Drive/US Route 209/NY Route 199 Westbound Ramps – The analysis indicates that the southbound Enterprise Drive left-turn movement operates at a LOS A during the PM peak hour for Existing and No-Build conditions. With construction of the proposed project, this movement will continue to operate at very good levels of service. No mitigation is necessary at this intersection.

2) Enterprise Drive/US Route 209/NY Route 199 Eastbound Ramps – The analysis indicates that this signalized intersection operates at an overall LOS

A during the PM peak hour for Existing and No-Build conditions with the northbound and southbound Enterprise Drive through movements operating at a LOS A and the eastbound US Route 209 Ramp left-turn movement operating at a LOS B. With construction of the proposed project, this intersection will continue to operate at an overall LOS A during the PM peak hour with the northbound and southbound approaches operating at a LOS A and the eastbound left-turn movement degrading to a LOS C. No mitigation is necessary at this intersection.

3) Enterprise Drive/North Driveway – The analysis indicates that the southbound left-turn lane operates at a LOS B during the PM peak hour for Existing conditions and will operate at a LOS B/C during 2014 and 2029 No-Build conditions. The analysis also indicates that the westbound North Driveway left-turn lane currently operates at a LOS D and will operate at a LOS D/E during 2014 and 2029 No-Build conditions. With construction of the proposed project, it is recommended that the bagged traffic signal be removed and that this intersection be converted to a right-in/right-out only driveway. It is recommended that a stop-sign be installed on the westbound approach to control vehicles turning right from the development. It is noted that southbound left-turn vehicles will be served by the adjacent intersection to the south via a modified jug-handle that utilizes the adjacent parallel road for US Route 209 traffic as shown on Figure 4.2.

4) Enterprise Drive/US Route 209 Eastbound Off Ramp/Middle Driveway – The analysis indicates that the eastbound shared left-turn/through lane currently operates at a LOS D during the PM peak hour for Existing conditions and will operate at a LOS D/E for the 2014 and 2029 No-Build condition. The yield controlled right-turn lane operates at a LOS B during the PM peak hour for Existing and both No-Build conditions. The analysis also indicates that the westbound Middle Driveway approach currently operates at a LOS D during the PM peak hour and will degrade to a LOS E/F during the 2014 and 2029 No-Build conditions. With the construction of the proposed project, the yield controlled eastbound right-turn lane will operate at a LOS B/C during the 2014 and 2029 Build conditions while the stop controlled eastbound and westbound approaches will operate at a LOS F.

A preliminary Peak Hour signal warrant analysis was conducted at this intersection to determine if traffic volumes will meet the warrants for the installation of a traffic signal for Build conditions. The hourly traffic volumes were compared to the signal warrant criteria set forth in the Federal *Manual on Uniform traffic Control Devices for Streets and Highways* (MUTCD), 2003 Edition. This publication specifies the minimum criteria that must be met in order for a new traffic signal to be justified. The Peak Hour warrant is met when for any one hour of an average day, points plotted on the graph presented on Figure 4C-4 of the MUTCD fall above the appropriate curve as contained in Appendix G. A review of the 2014 and 2029 Build traffic

volumes indicates that this warrant is satisfied during the PM peak hour. Therefore, it is recommended that this intersection operate under traffic signal control for Build conditions.

As shown in Figure 4.2, it is recommended that the southbound left-turns into the site utilize a modified jug handle to access the parallel road and cross Enterprise Drive. It is also recommended that the eastbound yield controlled right-turn lane be reconstructed to utilize the traffic signal at the Middle Driveway so drivers do not have to look back over their shoulders to merge into southbound traffic on Enterprise Drive and that the westbound Middle Driveway approach provide separate left and right turn lanes. The level of service analysis indicates that this intersection will operate at an overall LOS B with all movements operating at a LOS C or better during the 2014 and 2029 Build conditions.

5/6) Enterprise Drive/North & South Loop Driveways – The analysis indicates that the northbound and southbound approaches operate at a LOS A during the PM peak hour for Existing and both No-Build conditions. The analysis also indicates that the eastbound and westbound Loop Driveway approaches will operate at a LOS D during the PM peak hour for Existing and 2014 No-Build conditions and a LOS E for 2029 No-Build conditions. With the construction of the proposed project, the northbound and southbound approaches will continue to operate at a LOS A while the eastbound and westbound Loop Driveway approaches will degrade to a LOS F during both design years.

It is recommended that exclusive northbound and southbound left-turn lanes be constructed on Enterprise Drive to remove all left-turning traffic from the through lanes. The analysis indicates that the northbound and southbound left-turn movements will continue to operate adequately and that the eastbound and westbound approaches will still operate at LOS F. This is reflective of the high through volumes on Enterprise Drive during the PM peak hour. It is noted that the Loop Driveways are ceremonial entrances that will serve low traffic volumes. Motorists exiting the Loop Driveway intersections will have the option of using the adjacent traffic signals so no additional mitigation is necessary.

7) Enterprise Drive/West Campus Driveway/South Driveway – The analysis indicates that this signalized intersection operates at an overall LOS A during the PM peak hour for Existing and both No-Build conditions with all movements operating at a LOS C or better. With construction of the proposed project, this intersection will operate at an overall LOS A during the PM peak hour for the 2014 Build condition and an overall LOS B for the 2029 Build condition. However, it is noted that this intersection is located approximately 300-feet north of the traffic signal at the Enterprise Drive/Boices Lane/Mountain View Court intersection. The analysis at this adjacent intersection indicates that the heavy southbound left-turn movement

will queue back toward and possibly through the West Campus Driveway/South Driveway intersection. Therefore, it is recommended that these intersections operate under a coordinated signal system to ensure that the southbound queue on Enterprise Drive does not block side street traffic from entering and exiting the West Campus Driveway/South Driveway intersection. It is also recommended that the westbound South Driveway approach provide an exclusive left-turn lane and a shared through/right-turn lane. The analysis indicates that this intersection will operate at an overall LOS B with these improvements under the 2014 and 2029 build conditions. No additional mitigation is necessary at this intersection.

8) Enterprise Drive/Boices Lane/Mountain View Court – The analysis indicates that this signalized intersection currently operates at an overall LOS B during the PM peak hour for Existing conditions and will operate at an overall LOS C during the PM peak hour for the 2014 and 2029 No-Build conditions. It is noted that the eastbound Boices Lane left-turn lane will operate at a LOS F during the 2029 No-Build condition. With construction of the proposed project, this intersection will operate at an overall LOS C/D during the PM peak hour with the eastbound Boices Lane left-turn lane operating at a LOS E/F during the 2014 and 2029 Build conditions. However and as noted above, the heavy southbound left-turn movement will also queue back toward the West Campus Driveway/South Driveway intersection located approximately 300-feet to the north. Therefore, it is recommended that these intersections operate under a coordinated signal system to ensure that the southbound queue on Enterprise Drive does not block side street traffic from entering and exiting the West Campus Driveway/South Driveway intersection. The analysis indicates that this intersection will continue to operate at an overall LOS C with all movements operating at a LOS D or better. No additional mitigation is necessary at this intersection.

9) Boices Lane/Middle Driveway/Dalewood Street – There is an existing site driveway on Boices Lane located between Elmwood Street and Locust Street. It is recommended that this site driveway be shifted to the west opposite Dalewood Street which is the approximate midpoint between Enterprise Drive and Morton Boulevard, and will improve access along Boices lane and into the residential land uses on the south side of Boices Lane. The analysis indicates that the northbound Dalewood Street approach will operate at a LOS D/E during the 2014 and 2029 design years while the southbound Middle Driveway approach will operate at a LOS F during the PM peak hour under stop sign control. The eastbound and westbound Boices Lane approaches would operate at a LOS A during the PM peak hour under unsignalized control.

A preliminary Peak Hour signal warrant analysis was conducted at this intersection to determine if traffic volumes will meet the warrants for the installation of a traffic signal for Build conditions. The hourly traffic volumes

were compared to the signal warrant criteria set forth in the MUTCD, 2003 Edition. The Peak Hour warrant is met when for any one hour of an average day, points plotted on the graph presented on Figure 4C-4 of the MUTCD fall above the appropriate curve as contained in Appendix G. A review of the 2014 and 2029 Build traffic volumes indicates that this warrant is satisfied during the PM peak hour. Therefore, it is recommended that a traffic signal be installed at this intersection for Build conditions. The analysis indicates that this intersection will operate at an overall LOS A with all movements operating at a LOS C or better during the PM peak hour for both Build conditions. No additional mitigation is necessary.

10/11) Boices Lane/Morton Boulevard/East Driveway – The analysis indicates that this signalized intersection currently operates at an overall LOS B during the PM peak hour and will degrade to an overall LOS C/D during the 2014 and 2029 No-Build conditions with the eastbound left-turn/through approach operating at a LOS F during the 2029 No-Build condition.

With construction of the proposed project, this intersection will degrade to an overall LOS F with the eastbound and northbound shared left-turn/through movement and the southbound left-turn movement operating at a LOS F during the PM peak hour for both Build conditions. It is recommended that the existing northbound Morton Boulevard approach be re-stripped to provide an exclusive left-turn lane and a shared through/right-turn lane. It is also recommended that a second eastbound through lane be constructed on Boices Lane and extended to the John Clark Drive/Driveway intersection and that eastbound left-turns into the site be restricted. This improvement is shown conceptually on Figure 4.3 as an asymmetrical widening to the north. The concept shows that ROW will need to be provided by the *Tech City Office Park* to accommodate the roadway widening project along the property frontage to the north of Boices Lane and that some existing utilities would need to be relocated. Widening to the north will avoid impacts to private property on the south (such as Stewarts) which are not within the control of the *Tech City Office Park*. It is noted that NYSDOT currently has a $410,000 grade crossing improvement project scheduled for 2010 which will upgrade circuits, gates, and flashers at this location. A meeting was held with representatives from the Town, Ulster County, and the NYSDOT and it was agreed that the NYSDOT project should explore the possibility of widening the Boices Lane railroad crossing to 4-lanes with pedestrian crossing accommodations within the railroad ROW. Mitigation for the proposed development would be completed along Boices Lane but outside the railroad ROW. It is also noted that it may be desirable to provide an exclusive left-turn lane and two through lanes with a shared right-turn lane on the westbound approach at this location to maximize intersection capacity. This alternative would require a 5-lane cross-section over the Boices Lane railroad crossing. The need for this additional lane could be addressed during final design including additional analysis of the AM peak hour and railroad pre-emption.

In addition to the proposed geometric improvements, the existing traffic signal should also be coordinated with the traffic signal located at the Boices Lane/John Clark Drive/Driveway intersection located approximately 275-feet to the east. The level of service analysis indicates that this intersection will operate at an overall LOS C with all movements operating at a LOS D or better during the PM peak hour under the 2014 and 2029 Build condition with these improvements.

Boices Lane/John Clark Drive/Plaza Driveway – The analysis indicates that this signalized intersection operates at an overall LOS A during the PM peak hour for Existing and No-Build conditions. It is recommended that the eastbound approach be re-stripped to provide a shared left-turn/through lane and a shared through/right-turn lane in order to line up with the proposed improvements at the Morton Boulevard/East Driveway intersection. It is also recommended that this intersection be coordinated with the Boices Lane/Morton Boulevard/East Driveway intersection as noted above and shown in Figure 4.3. With construction of the proposed project, this intersection will continue to operate at an overall LOS A with all movements operating at a LOS C or better.

It is noted that the existing CSX railroad tracks cross Boices Lane between the Morton Boulevard/East Driveway intersection and John Clark Drive/Plaza Driveway intersection and the traffic signals are pre-empted when a train is present. Any improvements at the intersection shall be coordinated with the NYSDOT to insure that adequate pre-emption is maintained. Based on discussions with the County, the geometry at the intersections should allow some lane groups to flow during pre-emption to minimize delay, particularly the exclusive northbound left-turn lane and the separate eastbound right-turn lane at the Boices Lane/Morton Boulevard/East Driveway intersection could be allowed operate during the pre-emption phase thus relieving traffic congestion on these heavy movements. In addition, the southbound shared left-turn/through lane at the Boices Lane/John Clark Drive/Plaza Driveway intersection could also be allowed to operate during times of the traffic signal pre-emption. However, the proposed re-stripping of the westbound Boices Lane approach to this intersection will remove the separate westbound right-turn lane causing right-turning vehicles to wait while the crossing gates are closed for a train. It is noted that that the westbound right-turn volume is less than 20 vehicles per hour during the PM peak hour.

B. Threshold Analysis

A threshold sensitivity analysis was conducted in order to determine when the proposed improvements at the Boices Lane/Morton Boulevard/East Driveway intersection and at the Boices Lane/John Clark Drive/Plaza Driveway intersection would be required to maintain adequate traffic operations at these locations. The level of

service analysis is provided for the 2014 design year and the detailed levels of service reports are included in Appendix H. Table 4.2 shows the results of the Level of Service calculations.

Table 4.2 – Threshold Level of Service Summary

Intersection			Control	PM Peak Hour			
				2014 No-Build	2014 Build 25% Threshold	2014 Build 50% Threshold	
10	Boices Ln/Morton Blvd/East Drwy		S	Existing Timing	Existing Timing	Existing Timing	Timing Optimization
	Boices Ln EB	LT		D (52.6)	D (54.4)	E (69.0)	D (46.6)
		R		A (8.7)	A (10.0)	B (12.9)	B (10.4)
	Boices Ln WB	L		B (17.9)	B (17.8)	B (17.3)	C (21.9)
		T		B (11.5)	B (11.1)	B (10.4)	B (10.5)
		R		A (0.0)	A (8.4)	A (7.8)	A (7.9)
	Morton Blvd NB	LT		C (23.8)	C (27.3)	D (43.5)	D (37.6)
		R		B (10.2)	B (10.7)	B (11.0)	B (12.2)
	East Drwy SB	L		C (32.9)	C (34.5)	C (33.5)	D (50.9)
		TR		C (31.9)	C (30.1)	C (25.8)	C (28.6)
		Overall		C (24.2)	C (25.8)	C (32.6)	C (27.0)
11	Boices Ln/John Clark Dr/Plaza Drwy		S	Existing Timing	Existing Timing	Existing Timing	Timing Optimization
	Boices Ln EB	LTTR		A (4.7)	A (4.7)	A (4.8)	A (4.7)
	Boices Ln WB	LT		A (4.4)	A (4.4)	A (4.2)	A (4.2)
		R		A (3.3)	A (3.2)	A (3.0)	A (3.0)
	Retail Drwy NB	LT		B (14.9)	B (15.5)	B (16.5)	B (16.5)
		R		B (14.1)	B (14.7)	B (15.6)	B (15.6)
	John Clark Dr SB	LT		B (14.6)	B (15.2)	B (16.2)	B (16.2)
		R		B (14.5)	B (15.1)	B (16.1)	B (16.1)
		Overall		A (6.6)	A (6.6)	A (6.7)	A (6.6)

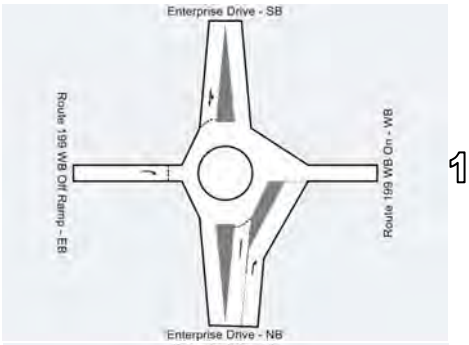
Key: TW, AW, S, R = Two-way stop, All-way stop, Signal, or Roundabout controlled intersection
NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound intersection approaches
L, T, R = Left-turn, through, and/or right-turn movements
X (Y.Y) = Level of Service (Average delay in seconds per vehicle)

The threshold analysis indicates these study area intersections will operate at the same levels of service with the development of up to 25 percent of the proposed project and no improvements. The analysis also indicates that with the development of up to 50 percent of the proposed project, these intersections will experience a level of service degradation on several approaches. However, with signal timing improvements, the intersections will operate adequately with up to 50 percent of the development traffic. Any development above and beyond 50 percent of the *Tech City Office Park* will likely require the geometric improvements detailed in the previous section to increase capacity at these intersections. Therefore, it is recommended that the signals be monitored and optimized after the occupancy of 25 percent of the proposed project. It is also recommended that the traffic volumes and operations at these intersections be monitored annually and/or coinciding with the development phases of the *Tech City*

Office Park to ensure that the signal timings will continue to maintain adequate traffic operations prior to the construction of the proposed geometric improvements.

C. Roundabout Analysis

An alternative intersection evaluation was completed to determine how six of the existing study area intersections would operate under roundabout control. Intersection evaluations were made using the Sidra Software (version 4.0). The level of service is provided for the 2014 and 2029 design years and the detailed levels of service reports are included in Appendix I. Table 4.3 shows the results of the Level of Service calculations.



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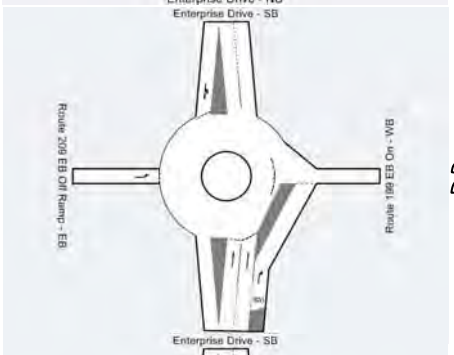

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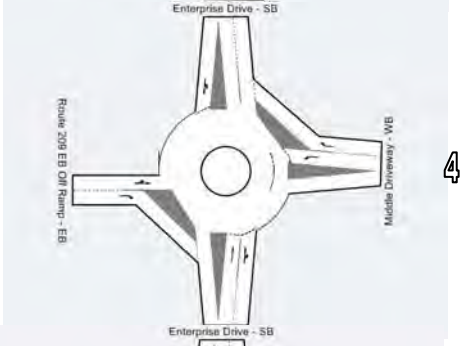

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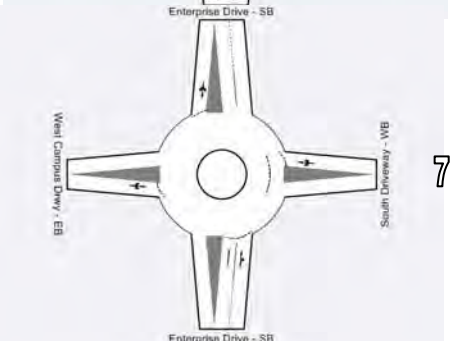

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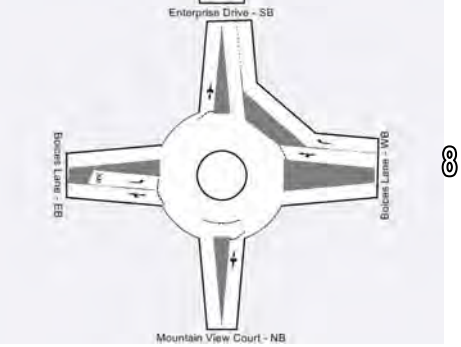
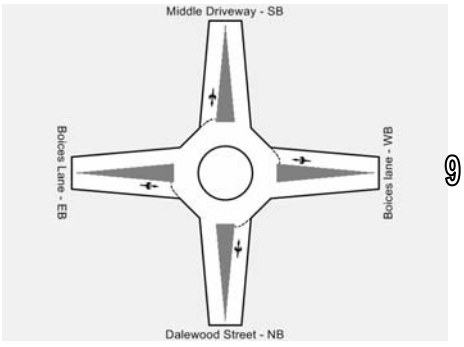


8

Table 4.3 – Roundabout Level of Service Summary

Intersection			Control	PM Peak Hour	
				2014 Design Year	2029 Design Year
1	Enterprise Dr/US Route 209/ NY Route 199 WB Ramps		R		
	Enterprise Dr NB	TTR		A (5.5)	A (5.7)
	Enterprise Dr SB	LT		A (5.0)	A (5.0)
	Route 199 EB	L		B (15.0)	B (15.5)
		Overall		A (5.9)	A (6.1)
2	Enterprise Dr/US Route 209/ NY Route 199 EB Ramps		R		
	Enterprise Dr NB	TTR		A (6.1)	A (6.5)
	Enterprise Dr SB	LT		A (5.9)	A (5.9)
	Route 209 EB	R		A (8.7)	A (9.7)
		Overall		A (6.2)	A (6.5)
4	Enterprise Dr/US Route 209 WB Off Ramp/Middle Drwy		R		
	Enterprise Dr NB	TTR		A (6.2)	A (6.4)
	Middle Drwy WB	LR		B (15.5)	C (24.8)
	Enterprise Dr SB	LT		A (5.8)	A (5.8)
	Route 209 WB Off EB	LTR		A (6.7)	A (7.7)
		Overall		A (7.7)	A (9.1)
7	Enterprise Dr/West Campus Drwy/ South Drwy		R		
	Enterprise Dr NB	TTR		A (5.9)	A (6.1)
	South Drwy WB	LTR		A (4.6)	B (14.6)
	Enterprise Dr SB	TR		A (5.8)	A (6.0)
	West Campus Drwy EB	LTR		B (15.2)	C (25.3)
		Overall		A (7.3)	A (8.2)
8	Enterprise Dr/Boices Ln/ Mountain View Ct		R		
	Mountain View Ct NB	LTR		B (13.7)	B (18.0)
	Boices Ln WB	LTR		A (5.9)	A (6.0)
	Enterprise Dr SB	LTR		B (12.5)	B (12.8)
	Boices Ln EB	LTR		B (15.3)	C (21.4)
		Overall		B (11.0)	B (13.1)
9	Boices Ln/Middle Drwy/Dalewood St		R		
	Dalewood St NB	LTR		B (15.9)	B (19.8)
	Boices Ln WB	LTR		A (5.3)	A (5.3)
	Middle Drwy SB	LTR		B (14.1)	B (15.5)
	Boices Ln EB	LTR		A (7.1)	A (9.7)
		Overall		A (7.0)	A (8.4)

Key: R = Roundabout controlled intersection
NB, SB, EB, WB = Northbound, Southbound, Eastbound, Westbound approaches
L, T, R = Left-turn, through, and/or right-turn movements
X (Y.Y) = Level of Service (Average delay in seconds per vehicle)

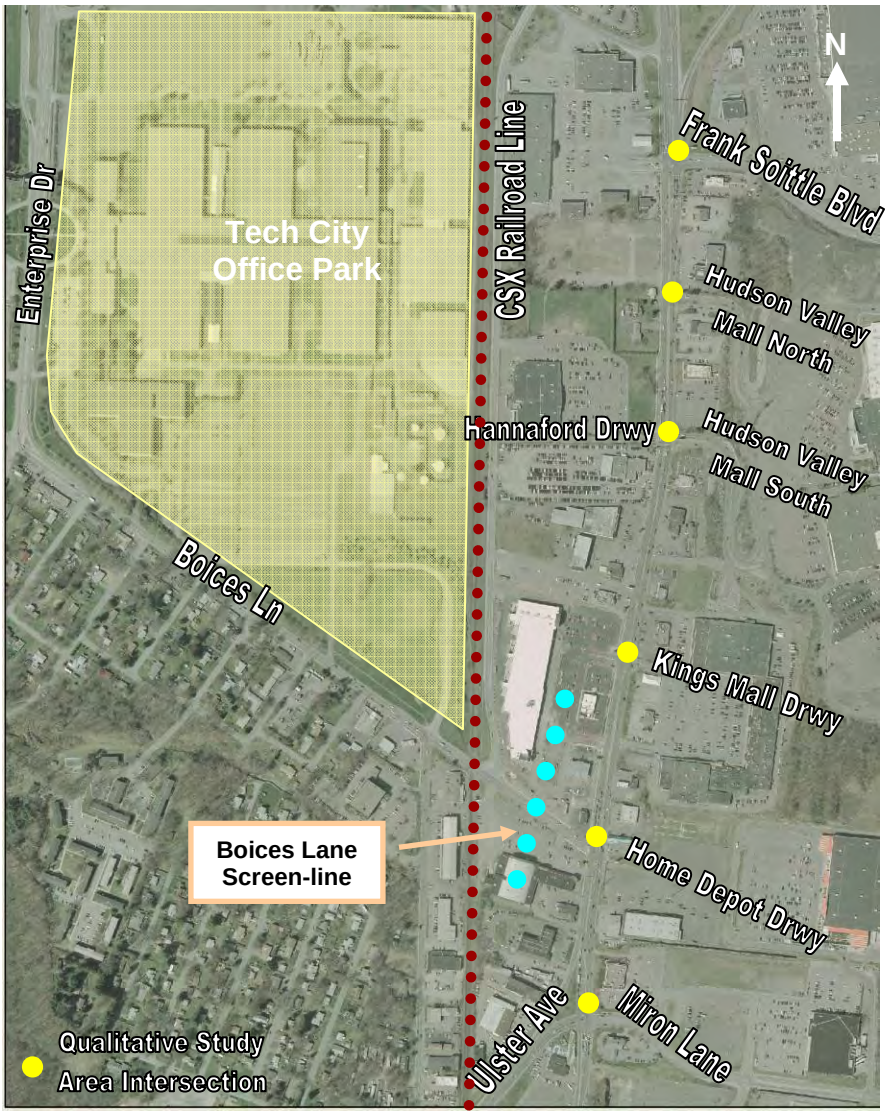


9

The analysis indicates that the six study area intersections will operate at an overall LOS B or better with all approaches operating at a LOS C or better under roundabout control with the geometry shown to the left of the table. In general, two northbound lanes would need to be provided on Enterprise Drive from the Boices Lane intersection to the Route 209/199 Ramp. This analysis indicates that the proposed development would not preclude a roundabout alternative if it were progressed as part of a potential public project along Enterprise Drive and Boices Lane. However, there will be impacts to ROW with the construction of a roundabout at several of the proposed intersections as shown in Figure 4.4. In addition, the spacing between the two roundabouts located at the West Campus Driveway/South Driveway and Boices Lane/Mountain View Court intersections could be problematic and will require more detailed analysis. It is noted that signalized control will provide adequate operations at these study area intersections after the construction of the proposed project and is the recommended mitigation.

D. Screen-Line Assessment

A qualitative intersection evaluation was conducted for several additional intersections located to the east along Route 9W as shown on the following aerial photograph. The assessment was conducted to determine if the proposed development will generate more trips through these intersections than previously anticipated as part of the *Frank Sottile EIS.* An increase in traffic from the *Tech City Office Park* could modify the recommendations found in the *Frank Sottile EIS*. Therefore, a screen-line traffic volume comparison was conducted on Boices Lane just west of Route 9W to determine the difference between traffic associated with re-occupancy of the IBM campus and other background traffic growth analyzed in the *Frank Sottile EIS* and traffic associated with the re-development of the site for the proposed *Tech City Office Park.* The location of the screen-line is shown on Aerial Photograph #1.



Aerial Photograph #1 – Boices Lane Screen-Line

A review of the 2028 traffic volumes used in the corridor analysis for the *Frank Sottile EIS* indicates that there were 1,256 PM peak hour trips at the Boices Lane screen-line. However, the Existing 2009 turning movement counts indicate that there are currently 780 PM peak hour trips at the Boices Lane screen-line. Table 4.4 shows the differences between 2014 and 2029 design year traffic volumes and the 2028 future traffic volumes analyzed in the *Frank Sottile EIS* on Boices Lane at the screen-line.

Table 4.4 – Traffic Volume Screen-Line Comparison

Condition	Two-Way Volume at Boices Lane Screen-Line	Difference From Screen-line Threshold
Frank Sottile EIS 2028 Volume (Screen-Line Threshold)	1,256 vph	--
2014 No-Build Volume	860 vph	-396 vph
2014 Build Volume	1,268 vph	+12 vph
2029 No-Build Volume	994 vph	-262 vph
2029 Build Volume	1,398 vph	+142 vph

The evaluation indicates that there are similar volumes on Boices Lane during the Build 2014 design year and the 2028 *Frank Sottile EIS* design year. Therefore, it is not anticipated that the construction of the proposed *Tech City Office Park* will change any of the conclusions found in the *Frank Sottile EIS* in the short term since the original Route 9W corridor analysis evaluated a similar number of trips generated by the re-development of this parcel. The evaluation also indicates that continued background growth will cause the Build 2029 traffic volumes to exceed the 2028 *Frank Sottile EIS* traffic volume threshold by approximately 142 vehicles per hour (vph). Therefore, it is recommended that traffic volumes and queuing on Boices Lane be monitored to determine the need for a force-off loop detector on the eastbound Boices Lane approach of the Route 9W intersection. This improvement would ensure that the queue will not extend through the John Clark Drive intersection and block the existing railroad crossing.

N

199

Old Neighborhood Rd.

1

2

3

North Drwy.

Convert to Right-In/Right-Out Only Driveway.

4

Middle Drwy.

Restrict SB Left-Turns and Reconstruct Parallel Road to Accomadate Traffic as a Jug Handle Intersection. Operate Under Traffic Signal Control.

WEST CAMPUS

Enterprise Dr.

EAST CAMPUS (PROJECT SITE)

5

North Loop Drwy.

Use the Existing Raised Median to Construct NB and SB Left-Turn Lanes at the Loop Driveways.

6

South Loop Drwy.

Provide an Exclusive WB Left-Turn Lane and a Shared WB Thru/Right-Turn Lane.

7

South Drwy.

Coordinate Traffic Signals.

8

Remove Existing Driveway.

ROW Needed along North side of Boises Ln. (Site Property)

Boices Lane

Middle Drwy.

9

Realign Middle Driveway Opposite Dalewood Street. Install Traffic Signal.

Dalewood St.

Locust St.

Elmwood St.

East Drwy.

John Clark Drive

Maintain Seperate Left-Turn, Thru, and Right-Turn Lanes on the Westbound Approach

Restripe NB Approach to Provide an Exclusive Left-Turn Lane and a Shared Thru/Right-Turn Lane.

Improvements are Shown as Asymetrical Widening on the North Side of Boices Lane to Avoid ROW Impacts to Private Property on the South Side of Boices Lane

10

Provide Additional EB Through Lane

Restripe WB Approach to Provide a Shared Thru/Left-Turn Lane and a Shared Thru/Right-Turn Lane.

11

Coordinate Traffic Signals.

Morton Blvd.

CME

PROJECT: 09-024d

DATE: 8/09

FIGURE: 4.1

OVERALL IMPROVEMENT SUMMARY
ULSTER TECH CITY
TOWN OF ULSTER, NY

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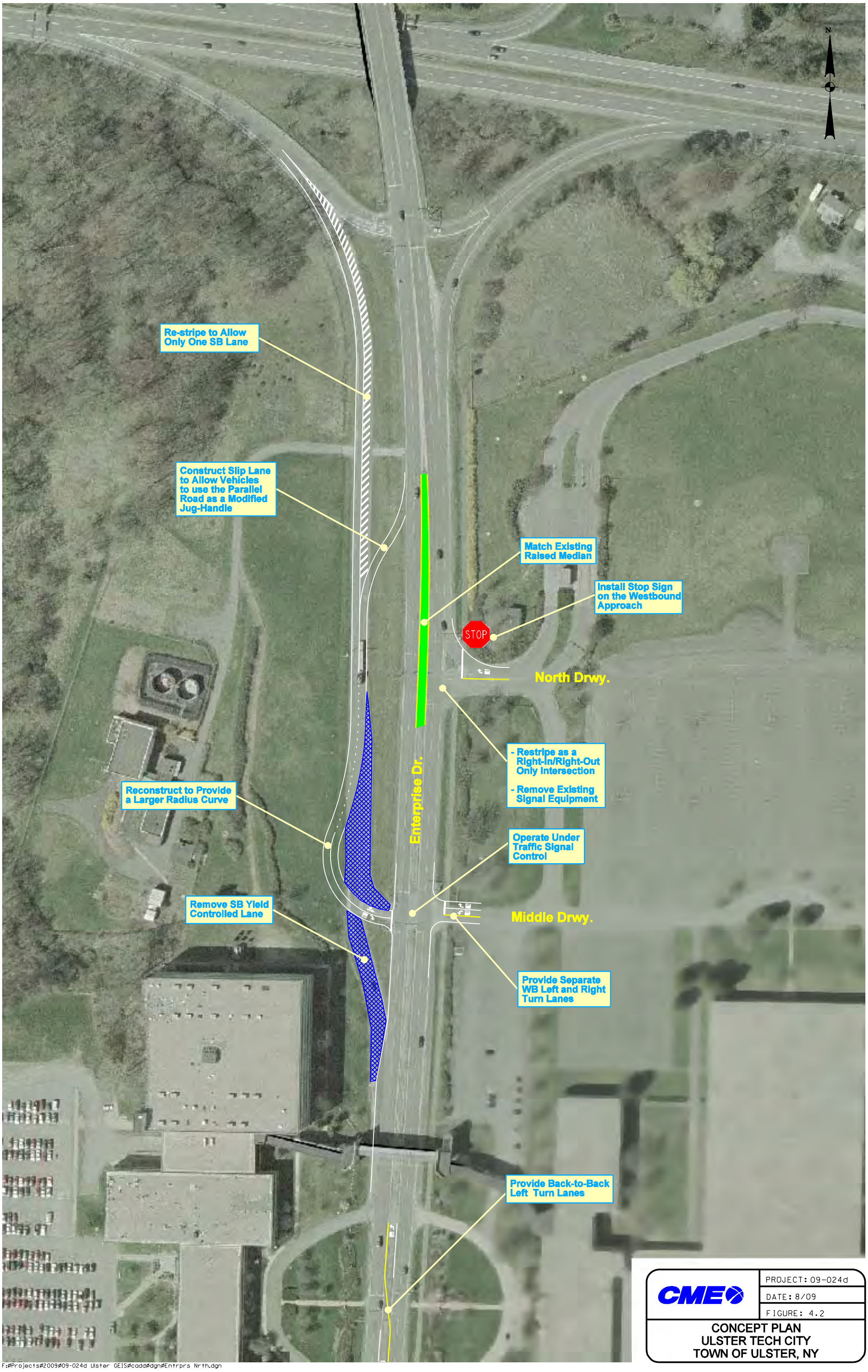

CME

PROJECT: 09-024d

DATE: 8/09

FIGURE: 4.2

CONCEPT PLAN
ULSTER TECH CITY
TOWN OF ULSTER, NY

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East Dwy.

John Clark Drive

Improvements are Shown as Asymetrical Widening on the North Side of Boices Lane to Avoid ROW Impacts to Private Property on the South Side of Boices Lane

Provide ROW for Roadway Widening

MATCH EXISTING

Maintain Seperate Left-Turn, Thru, and Right-Turn Lanes on the WB Approach

MATCH EXISTING

Re-Stripe WB Approach to Provide a Shared Left-Turn/ Thru Lane and a Shared Thru/ Right-Turn Lane

MATCH EXISTING

Coordinate Traffic Signals at Both Intersections

Approximate R.O.W.

Approximate R.O.W.

Boices Lane

Provide Additional EB Through Lane

MATCH EXISTING

Driveway

Coordinate Traffic Signals at Both Intersections

Provide 4-Lane Cross Section Across Railroad Tracks

Restripe NB Approach to Provide an Exclusive Left-Turn Lane and a Shared Thru/Right-Turn Lane.

Morton Blvd.

NOTE: FOR PLANNING PURPOSES ONLY

PARCEL BOUNDARY AND APPROXIMATE ROW

CME

PROJECT: 09-024d

DATE: 8/09

FIGURE: 4.3

BOICES LANE CONCEPT PLAN
ULSTER TECH CITY
TOWN OF ULSTER, NY

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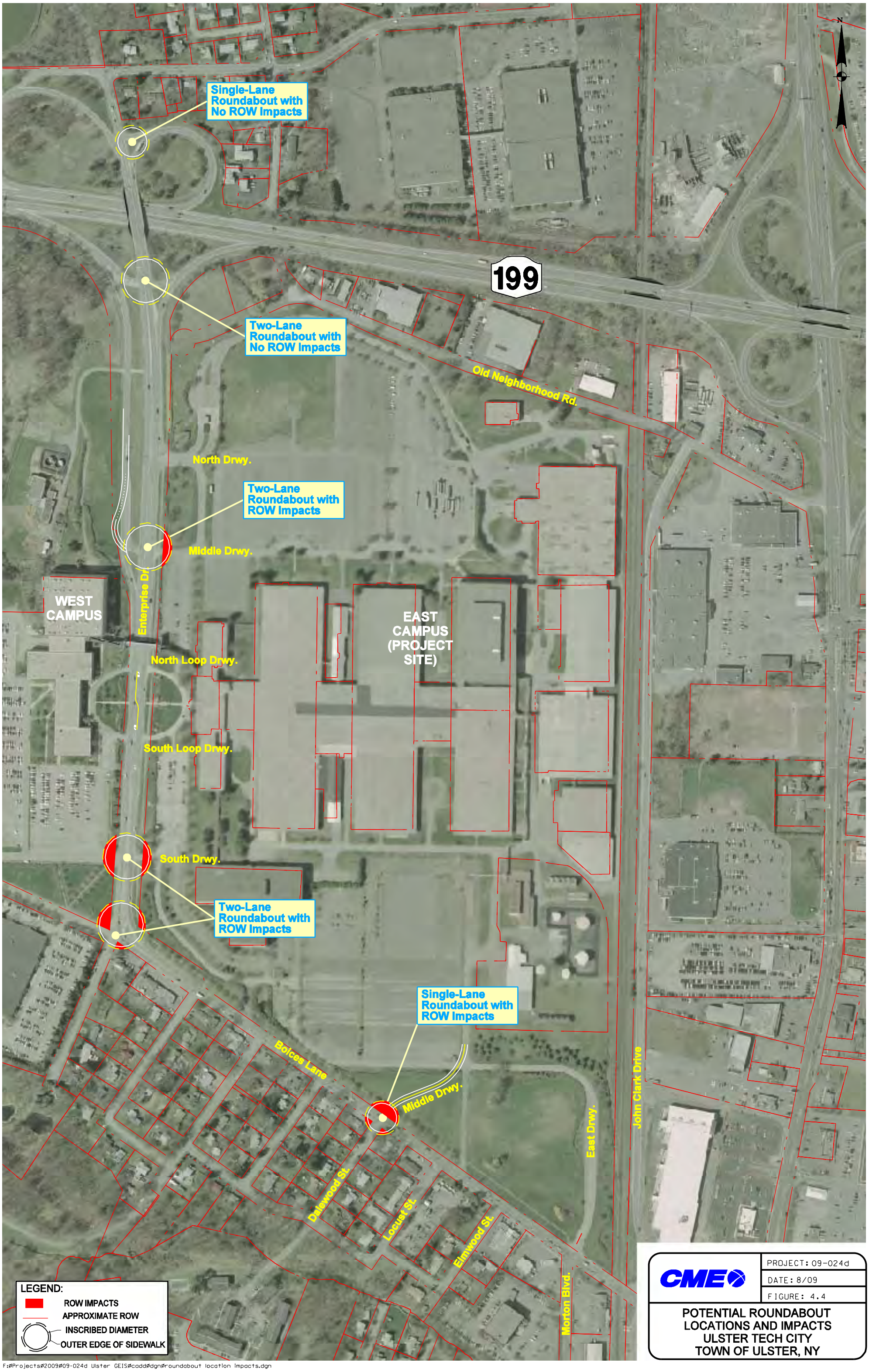


F:\Projects\2009\09-024d Ulster GEIS\cadd\dgn\roundabout location impacts.dgn

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this Traffic Impact Study completed for the proposed *Tech City Office Park*, the following conclusions and recommendations are provided:

A. The existing East Campus is an approximate 2,164,000 SF development consisting primarily of office and industrial space. The proposed development plan includes the demolition of approximately 290,000 SF of obsolete buildings, the reuse of 558,000 SF of two existing buildings for interior parking, the continued use of 1,318,000 SF of existing buildings, and the construction of approximately 645,000 SF of new buildings. Therefore, the building gross floor area of the new campus will be reduced to approximately 1,963,000 SF spread out over 5 parcels.

B. Access to the site will be provided via three intersections on Old Neighborhood Road, five intersections on Enterprise Drive, and two intersections on Boices Lane. Five (5) of the intersections are proposed as public streets. The remaining access points will be low volume or turn restricted driveways. It is noted that the existing ceremonial drop-off loop for one-way entering and exiting traffic located in front of Parcel B on Enterprise Drive will remain open.

C. Accounting for pass-by and multi-use trips, the *Tech City Office Park* will generate a total of 1,758 new vehicle trips during the PM peak hour with 456 trips entering and 1,302 trips exiting.

D. The level of service analysis indicates that the study area intersections will operate adequately with the improvements summarized on Figures 4.1 through 4.3after full build-out of the *Tech City Office Park* development. The recommendations and findings for each intersection is cited below:

    1) Enterprise Driveway/US Route 209/NY Route 199 WB Ramps – No improvements recommended.
    2) Enterprise Driveway/US Route 209/NY Route 199 EB Ramps – No improvements recommended.
    3) Enterprise Drive/North Driveway – Remove existing bagged traffic signal. Convert intersection to a right-in/right-out only driveway and install a stop-sign on the westbound approach. Southbound left-turn vehicles will be served by the adjacent intersection to the south via a modified jug-handle that utilizes the adjacent parallel road for US Route 209 traffic.
    4) Enterprise Drive/US Route 209 EB Off Ramp/Middle Driveway – This intersection should operate under traffic signal control. The southbound left-turns into the site will utilize a modified jug handle to access the parallel road and cross Enterprise Drive. The eastbound yield controlled

right-turn lane should be reconstructed to utilize the traffic signal at the Middle Driveway so drivers do not have to look back over their shoulders to merge into southbound traffic on Enterprise Drive and the westbound Middle Driveway approach should provide separate left and right turn lanes.

5/6) Enterprise Drive/North & South Loop Driveways – Construct exclusive northbound and southbound left-turn lanes on Enterprise Drive to remove all left-turning traffic from the through lanes.

7) Enterprise Drive/West Campus Driveway/South Driveway – The South Driveway and Boices Lane/Mountain View Court intersections on Enterprise Drive should operate under a coordinated signal system to ensure that the southbound queue on Enterprise Drive does not block side street traffic from entering and exiting the development. An exclusive left-turn lane and a shared through/right-turn lane should be provided on the westbound South Driveway approach.

8) Enterprise Drive/Boices Lane/Mountain View Court – The South Driveway and Boices Lane/Mountain View Court intersections on Enterprise Drive should operate under a coordinated signal system to ensure that the southbound queue on Enterprise Drive does not block side street traffic from entering and exiting the development.

9) Boices Lane/Middle Driveway/Dalewood Street – The existing site driveway on Boices Lane located between Elmwood Street and Locust Street should be shifted to the west opposite Dalewood Street which is the approximate midpoint between Enterprise Drive and Morton Boulevard. A traffic signal should be installed. Note the westerly most minor site driveway on Boices Lane shown on the original concept plan should be eliminated.

10) Boices Lane/Morton Boulevard/East Driveway – The existing northbound Morton Boulevard approach should be re-stripped to provide an exclusive left-turn lane and a shared through/right-turn lane. A second eastbound through lane should be constructed on Boices Lane and extended to the John Clark Drive/Driveway intersection with asymmetrical widening to the north. ROW will be needed along the project frontage to complete the widening. Eastbound left-turns should be restricted into the site. NYSDOT currently has a $410,000 grade crossing improvement project scheduled for 2010 which will upgrade circuits, gates, and flashers at this location. Based on discussions with the NYSDOT, the project should explore the possibility of widening the Boices Lane crossing to 4-lanes with pedestrian crossing accommodations within the railroad ROW. Mitigation for the proposed development would be completed along Boices Lane but outside the railroad ROW. The existing traffic signal should be coordinated with the Boices Lane/John Clark Drive/Plaza Driveway intersection.

11) Boices Lane/John Clark Drive/Plaza Driveway – The eastbound approach should be re-stripped to provide a shared left-turn/through lane and a shared through/right-turn lane in order to line up with the proposed

improvements at the Morton Boulevard/East Driveway intersection. This intersection should also be coordinated with the Boices Lane/Morton Boulevard/East Driveway intersection.

Any improvements at the Boices Lane/Morton Boulevard/East Driveway intersection or the Boices Lane John Clark Drive/Plaza Driveway intersection shall be coordinated with the NYSDOT to insure that adequate pre-emption is maintained with the CSX rail crossing.

E. A threshold sensitivity analysis conducted at the Boices Lane/Morton Boulevard/East Driveway intersection and at the Boices Lane/John Clark Drive/Plaza Driveway intersection indicates these study area intersections will operate at the same levels of service with up to 25 percent of the proposed project with no improvements and will continue to operate adequately with the development of up to 50 percent of the proposed project with signal timing improvements. It is recommended that the signals be monitored and optimized after occupancy of 25 percent of the proposed project and that they continue to be monitored annually and/or coinciding with the development phases of the *Tech City Office Park* to ensure that the proposed signal timing improvements will maintain adequate traffic operations prior to the construction of the proposed geometric improvements.

F. A roundabout intersection evaluation conducted at six of the existing study area intersection indicates that these intersections will operate at adequate levels of service after the construction of the proposed development. This analysis indicates that the proposed development would not preclude a roundabout alternative if it were progressed as part of a potential public project along Enterprise Drive and Boices Lane. However, there will be impacts to ROW with the construction of a roundabout at several of the proposed intersections. In addition, the spacing between the two roundabouts located at the West Campus Driveway/South Driveway and Boices Lane/Mountain View Court intersections could be problematic and will require more detailed analysis. Traffic signals are recommended as mitigation for the project.

G. A qualitative evaluation was conducted to determine if the proposed development will generate more trips on Boices Lane approaching Route 9W as compared to the *Frank Sottile EIS.* The screen-line analysis indicates that there are similar volumes on Boices Lane during the Build 2014 design year and the 2028 *Frank Sottile EIS* design year. Therefore, the conclusions found in the *Frank Sottile EIS* will not change in the short term since the original Route 9W corridor analysis evaluated a similar number of trips generated by the re-development of this parcel. The evaluation also indicates that continued background growth will cause the Build 2029 traffic volumes to exceed the 2028 *Frank Sottile EIS* traffic volume threshold. Therefore, it is recommended that traffic volumes and queuing on Boices Lane be monitored to determine the need for a force-off loop detector

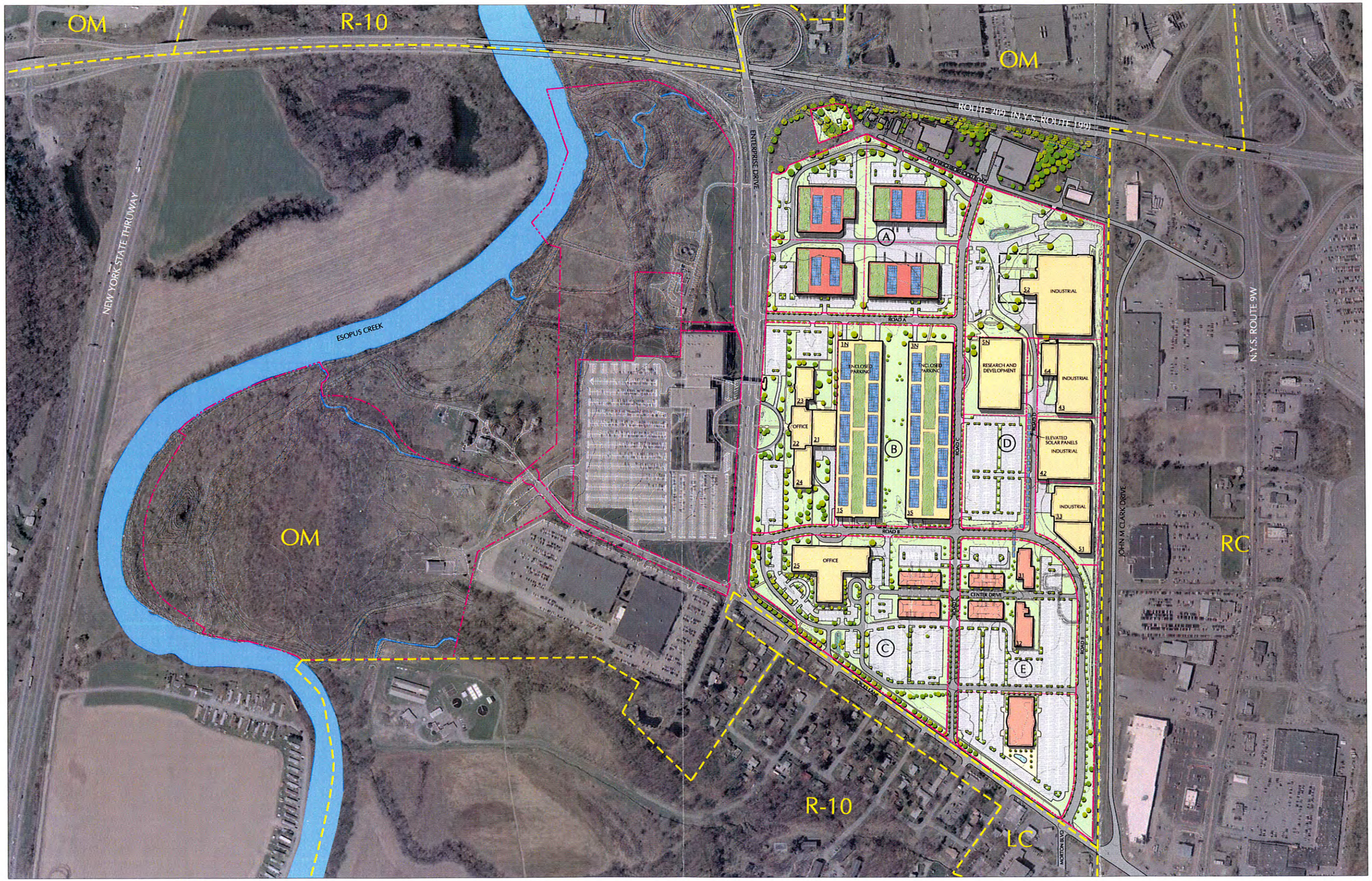
on the eastbound Boices Lane approach of the Route 9W intersection to insure traffic does not back-up to the rail crossing.

The potential traffic impacts of the proposed mixed use development will be mitigated with implementation of the recommended improvements.

Appendix A –Conceptual Site Plan

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

TECH CITY- TOWN OF ULSTER, NY



DIVNEY • TUNG • SCHWALBE
Intelligent Land Use

Note: This plan pre-dates the Traffic Study and does not necessarily reflect the access recommendations found in the report.

CAMPUS MASTER PLAN

JANUARY 27, 2009

Appendix B – Raw Turing Movement

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

Project: 09-024d
Counted By: MDN
Location: Ulster, NY
Other:

File Name : tm09024p1
Site Code : 09-024-1
Start Date : 4/23/2009
Page No : 1

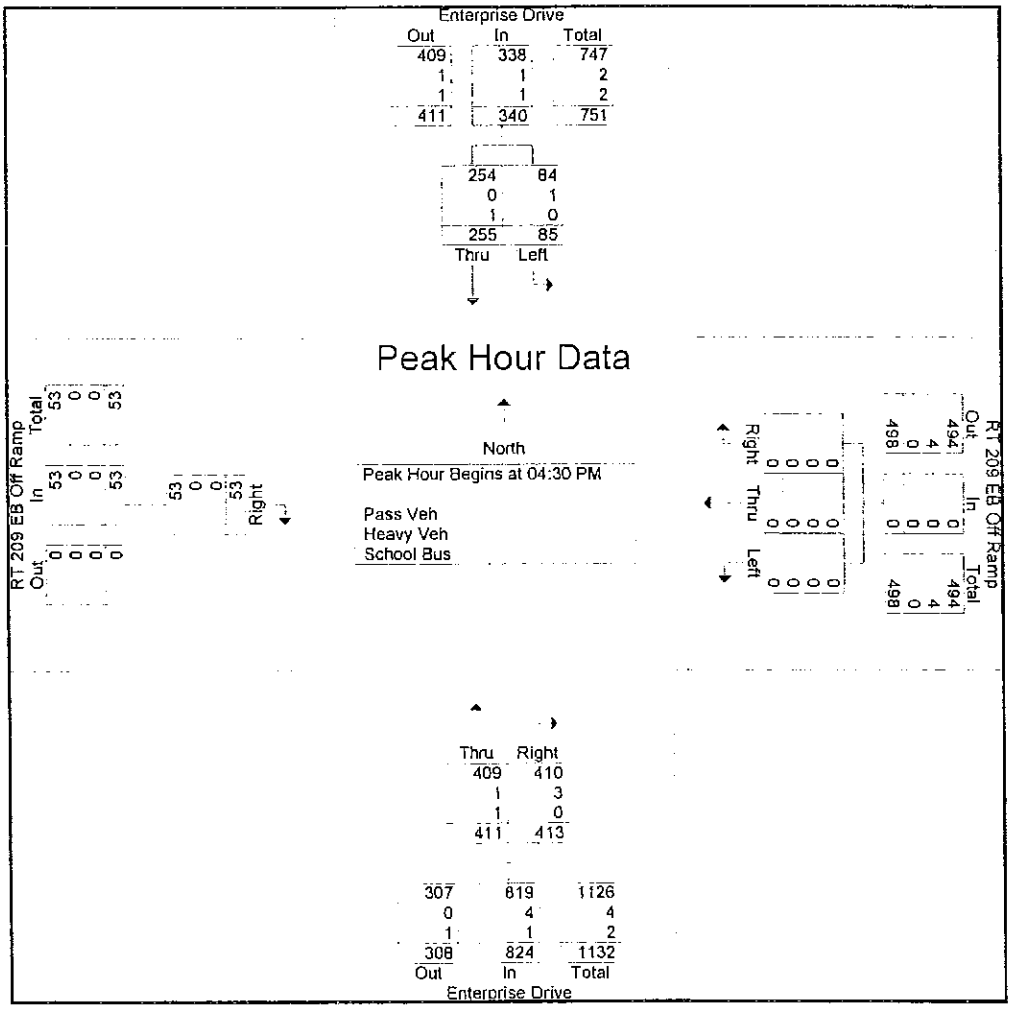
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Enterprise Drive Southbound			RT 209 EB Off Ramp Westbound				Enterprise Drive Northbound			RT 209 EB Off Ramp Eastbound		
Start Time	Left	Thru	App. Total	Left	Thru	Right	App. Total	Thru	Right	App. Total	Right	App. Total	Int. Total
Factor	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0		
04:00 PM	29	60	89	0	0	0	0	108	86	194	13	13	296
04:15 PM	23	46	69	0	0	0	0	114	78	192	14	14	275
04:30 PM	23	48	71	0	0	0	0	122	106	228	15	15	314
04:45 PM	12	53	65	0	0	0	0	103	109	212	18	18	295
Total	87	207	294	0	0	0	0	447	379	826	60	60	1180
05:00 PM	35	94	129	0	0	0	0	104	108	212	14	14	355
05:15 PM	15	60	75	0	0	0	0	82	90	172	6	6	253
05:30 PM	36	60	96	0	0	0	0	89	84	173	11	11	280
05:45 PM	20	82	102	0	0	0	0	71	69	140	9	9	251
Total	106	296	402	0	0	0	0	346	351	697	40	40	1139
Grand Total	193	503	696	0	0	0	0	793	730	1523	100	100	2319
Apprch %	27.7	72.3		0	0	0		52.1	47.9		100		
Total %	8.3	21.7	30	0	0	0	0	34.2	31.5	65.7	4.3	4.3	
Pass Veh	190	501	691	0	0	0	0	788	724	1512	99	99	2302
% Pass Veh	98.4	99.6	99.3	0	0	0	0	99.4	99.2	99.3	99	99	99.3
Heavy Veh	3	1	4	0	0	0	0	2	6	8	1	1	13
% Heavy Veh	1.6	0.2	0.6	0	0	0	0	0.3	0.8	0.5	1	1	0.6
School Bus	0	1	1	0	0	0	0	3	0	3	0	0	4
% School Bus	0	0.2	0.1	0	0	0	0	0.4	0	0.2	0	0	0.2

Project: 09-024d
Counted By: MDN
Location: Ulster, NY
Other:

File Name : tm09024p1
Site Code : 09-024-1
Start Date : 4/23/2009
Page No : 2

	Enterprise Drive Southbound			RT 209 EB Off Ramp Westbound				Enterprise Drive Northbound			RT 209 EB Off Ramp Eastbound		
Start Time	Left	Thru	App. Total	Left	Thru	Right	App. Total	Thru	Right	App. Total	Right	App. Total	Int. Total
Peak Hour Analysis From 4:30:00 PM to 5:15:00 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 4:30:00 PM													
4:30:00 PM	23	48	71	0	0	0	0	122	106	228	15	15	314
4:45:00 PM	12	53	65	0	0	0	0	103	109	212	18	18	295
5:00:00 PM	35	94	129	0	0	0	0	104	108	212	14	14	355
5:15:00 PM	15	60	75	0	0	0	0	82	90	172	6	6	253
Total Volume	85	255	340	0	0	0	0	411	413	824	53	53	1217
% App. Total	25	75		0	0	0		49.9	50.1		100		
PHF	.607	.678	.659	.000	.000	.000	.000	.842	.947	.904	.736	.736	.857
Pass Veh	84	254	338	0	0	0	0	409	410	819	53	53	1210
% Pass Veh	98.8	99.6	99.4	0	0	0	0	99.5	99.3	99.4	100	100	99.4
Heavy Veh	1	0	1	0	0	0	0	1	3	4	0	0	5
% Heavy Veh	1.2	0	0.3	0	0	0	0	0.2	0.7	0.5	0	0	0.4
School Bus	0	1	1	0	0	0	0	1	0	1	0	0	2
% School Bus	0	0.4	0.3	0	0	0	0	0.2	0	0.1	0	0	0.2



Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm9024p2
Site Code : 09-024-2
Start Date : 4/23/2009
Page No : 1

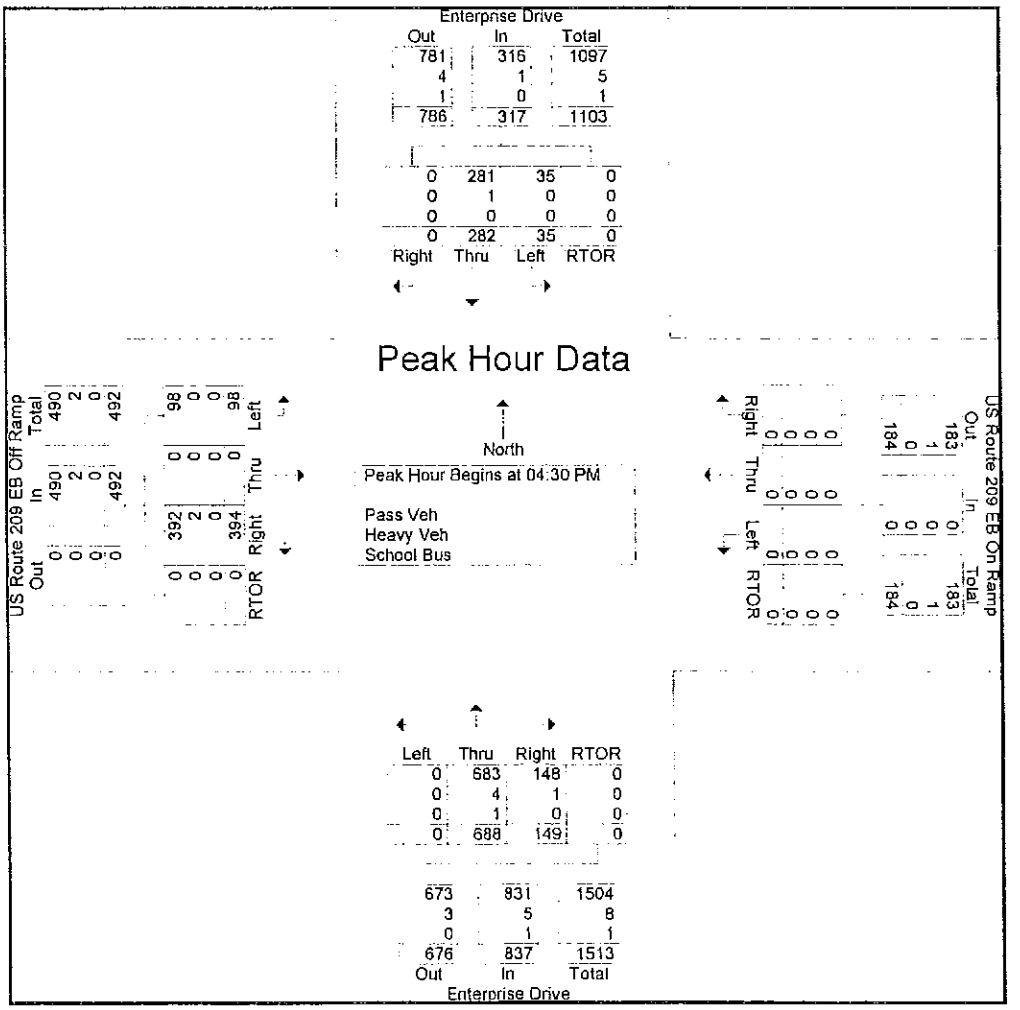
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Enterprise Drive Southbound					US Route 209 EB On Ramp Westbound					Enterprise Drive Northbound					US Route 209 EB Off Ramp Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	10	69	0	0	79	0	0	0	0	0	0	168	13	0	181	27	1	88	0	116	376
04:15 PM	7	43	0	0	50	0	0	0	0	0	0	158	10	0	168	21	0	87	0	108	326
04:30 PM	10	67	0	0	77	0	0	0	0	0	0	183	75	0	258	22	0	78	0	100	435
04:45 PM	2	64	0	0	66	0	0	0	0	0	0	183	36	0	219	25	0	114	0	139	424
Total	29	243	0	0	272	0	0	0	0	0	0	692	134	0	826	95	1	367	0	463	1561
05:00 PM	12	76	0	0	88	0	0	0	0	0	0	182	25	0	207	26	0	120	0	146	441
05:15 PM	11	75	0	0	86	0	0	0	0	0	0	140	13	0	153	25	0	82	0	107	346
05:30 PM	6	64	0	0	70	0	0	0	0	0	0	132	14	0	146	23	1	73	0	97	313
05:45 PM	4	80	0	0	84	0	0	0	0	0	0	129	8	0	137	17	0	75	0	92	313
Total	33	295	0	0	328	0	0	0	0	0	0	583	60	0	643	91	1	350	0	442	1413
Grand Total	62	538	0	0	600	0	0	0	0	0	0	1275	194	0	1469	186	2	717	0	905	2974
Apprch %	10.3	89.7	0	0		0	0	0	0		0	86.8	13.2	0		20.6	0.2	79.2	0		
Total %	2.1	18.1	0	0	20.2	0	0	0	0	0	0	42.9	6.5	0	49.4	6.3	0.1	24.1	0	30.4	
Pass Veh	62	537	0	0	599	0	0	0	0	0	0	1267	193	0	1460	185	2	703	0	890	2949
% Pass Veh	100	99.8	0	0	99.8	0	0	0	0	0	0	99.4	99.5	0	99.4	99.5	100	98	0	98.3	99.2
Heavy Veh	0	1	0	0	1	0	0	0	0	0	0	7	1	0	8	0	0	8	0	8	17
% Heavy Veh	0	0.2	0	0	0.2	0	0	0	0	0	0	0.5	0.5	0	0.5	0	0	1.1	0	0.9	0.6
School Bus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	6	0	7	8
% School Bus	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0.5	0	0.8	0	0.8	0.3

Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm9024p2
Site Code : 09-024-2
Start Date : 4/23/2009
Page No : 2

	Enterprise Drive Southbound					US Route 209 EB On Ramp Westbound					Enterprise Drive Northbound					US Route 209 EB Off Ramp Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:30:00 PM																					
4:30:00 PM	10	67	0	0	77	0	0	0	0	0	0	183	75	0	258	22	0	78	0	100	435
4:45:00 PM	2	64	0	0	66	0	0	0	0	0	0	183	36	0	219	25	0	114	0	139	424
5:00:00 PM	12	76	0	0	88	0	0	0	0	0	0	182	25	0	207	26	0	120	0	146	441
5:15:00 PM	11	75	0	0	86	0	0	0	0	0	0	140	13	0	153	25	0	82	0	107	346
Total Volume	35	282	0	0	317	0	0	0	0	0	0	688	149	0	837	98	0	394	0	492	1646
% App. Total	11	89	0	0		0	0	0	0		0	82.2	17.8	0		19.9	0	80.1	0		
PHF	.729	.928	.000	.000	.901	.000	.000	.000	.000	.000	.000	.940	.497	.000	.811	.942	.000	.821	.000	.842	.933
Pass Veh	35	281	0	0	316	0	0	0	0	0	0	683	148	0	831	98	0	392	0	490	1637
% Pass Veh	100	99.6	0	0	99.7	0	0	0	0	0	0	99.3	99.3	0	99.3	100	0	99.5	0	99.6	99.5
Heavy Veh	0	1	0	0	1	0	0	0	0	0	0	4	1	0	5	0	0	2	0	2	8
% Heavy Veh	0	0.4	0	0	0.3	0	0	0	0	0	0	0.6	0.7	0	0.6	0	0	0.5	0	0.4	0.5
School Bus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
% School Bus	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0.1



NORTH DRWY ON
ENTER FREISE DRIVE

09-024D

DPR
4/23/09

Vehicle Turn Movements

time	# of vehicles LEFT IN	# of vehicles RIGHT IN	# of vehicles
4:00			
05			
10		1	
15		1	
20			
25			
30	T	1	
35			
40			
45			
50	1		
55			
5:00			
05		T	
10			
15			
20	1		
25			
30			
35			
40			
45			
50			
55			

time	# of vehicles LEFT OUT	# of vehicles RIGHT OUT	# of vehicles
4:00		1	
05			
10		1	
15	1		
20		1	
25	T	T	
30	1	TT	
35		1	
40		1	
45			
50		1	
55			
5:00			
05			
10	1	1	
15		111	
20			
25			
30			
35		1	
40		T	
45			
50			
55			

T: TRUCK

CME
CREIGHTON MANNING ENGINEERING, LLP

Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm09024p7
Site Code : 09-024-7
Start Date : 5/6/2009
Page No : 1

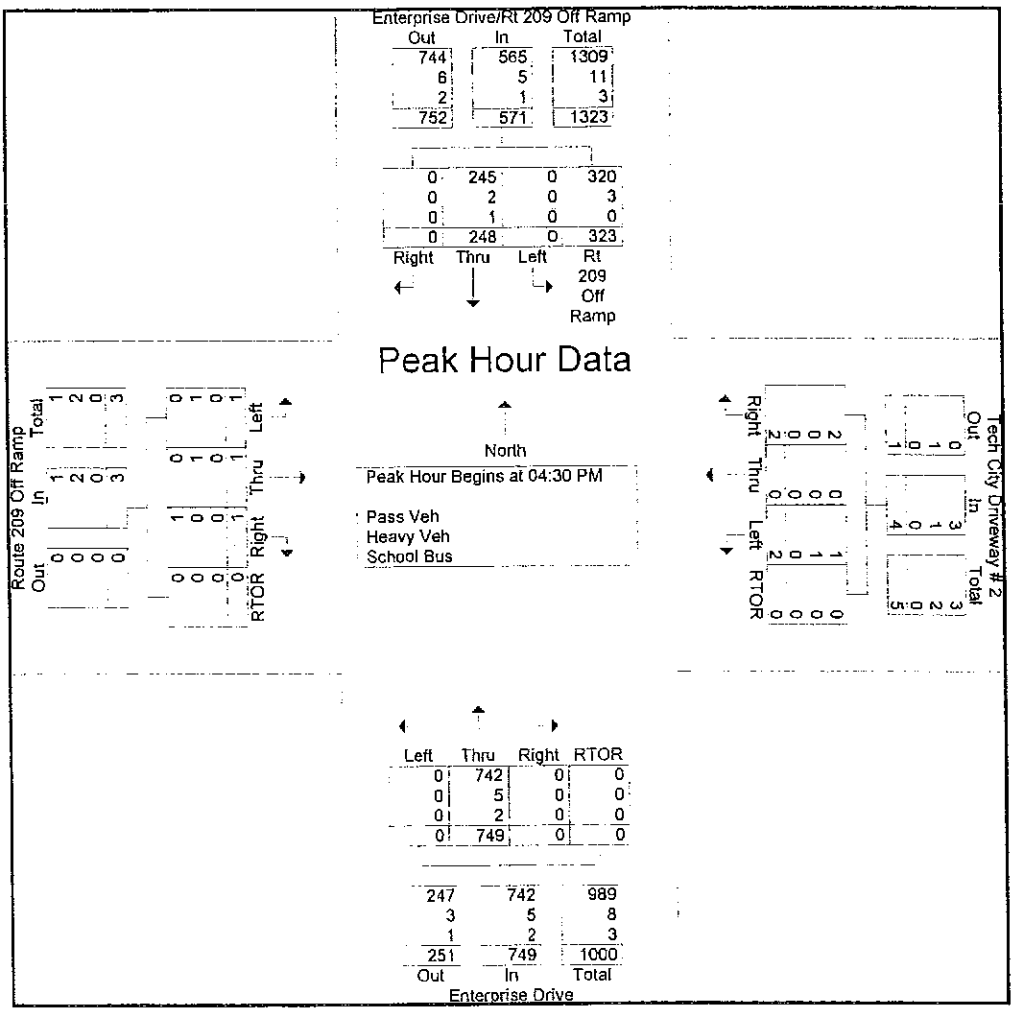
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Enterprise Drive/Rt 209 Off Ramp Southbound					Tech City Driveway # 2 Westbound					Enterprise Drive Northbound					Route 209 Off Ramp Eastbound					
Start Time	Left	Thru	Right	Rt 209 Off Ramp	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	0	50	0	73	123	1	0	0	0	1	0	147	1	0	148	0	1	0	0	1	273
04:15 PM	0	38	0	73	111	1	0	1	0	2	0	155	0	0	155	2	0	0	0	2	270
04:30 PM	0	46	0	69	115	0	0	0	0	0	0	249	0	0	249	0	1	1	0	2	366
04:45 PM	0	51	0	88	139	0	0	2	0	2	0	178	0	0	178	0	0	0	0	0	319
Total	0	185	0	303	488	2	0	3	0	5	0	729	1	0	730	2	2	1	0	5	1228
05:00 PM	0	78	0	81	159	0	0	0	0	0	0	174	0	0	174	1	0	0	0	1	334
05:15 PM	0	73	0	85	158	2	0	0	0	2	0	148	0	0	148	0	0	0	0	0	308
05:30 PM	0	74	0	67	141	0	0	0	0	0	0	130	0	0	130	1	1	0	0	2	273
05:45 PM	1	62	0	93	156	0	0	0	0	0	0	125	0	0	125	0	0	0	0	0	281
Total	1	287	0	326	614	2	0	0	0	2	0	577	0	0	577	2	1	0	0	3	1196
Grand Total	1	472	0	629	1102	4	0	3	0	7	0	1306	1	0	1307	4	3	1	0	8	2424
Apprch %	0.1	42.8	0	57.1		57.1	0	42.9	0		0	99.9	0.1	0		50	37.5	12.5	0		
Total %	0	19.5	0	25.9	45.5	0.2	0	0.1	0	0.3	0	53.9	0	0	53.9	0.2	0.1	0	0	0.3	
Pass Veh	1	465	0	615	1081	3	0	3	0	6	0	1296	1	0	1297	1	1	1	0	3	2387
% Pass Veh	100	98.5	0	97.8	98.1	75	0	100	0	85.7	0	99.2	100	0	99.2	25	33.3	100	0	37.5	98.5
Heavy Veh	0	5	0	9	14	1	0	0	0	1	0	8	0	0	8	3	2	0	0	5	28
% Heavy Veh	0	1.1	0	1.4	1.3	25	0	0	0	14.3	0	0.6	0	0	0.6	75	66.7	0	0	62.5	1.2
School Bus	0	2	0	5	7	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	9
% School Bus	0	0.4	0	0.8	0.6	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.4

Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm09024p7
Site Code : 09-024-7
Start Date : 5/6/2009
Page No : 2

	Enterprise Drive/Rt 209 Off Ramp Southbound					Tech City Driveway # 2 Westbound					Enterprise Drive Northbound					Route 209 Off Ramp Eastbound					
Start Time	Left	Thru	Right	Rt 209 Off Ramp	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:30:00 PM																					
4:30:00 PM	0	46	0	69	115	0	0	0	0	0	0	**249**	0	0	**249**	0	1	1	0	2	**366**
4:45:00 PM	0	51	0	**88**	139	0	0	**2**	0	**2**	0	178	0	0	178	0	0	0	0	0	319
5:00:00 PM	0	**78**	0	81	**159**	0	0	0	0	0	0	174	0	0	174	1	0	0	0	1	334
5:15:00 PM	0	73	0	85	158	**2**	0	0	0	2	0	148	0	0	148	0	0	0	0	0	308
Total Volume	0	248	0	323	571	2	0	2	0	4	0	749	0	0	749	1	1	1	0	3	1327
% App. Total	0	43.4	0	56.6		50	0	50	0		0	100	0	0		33.3	33.3	33.3	0		
PHF	.000	.795	.000	.918	.898	.250	.000	.250	.000	.500	.000	.752	.000	.000	.752	.250	.250	.250	.000	.375	.906
Pass Veh	0	245	0	320	565	1	0	2	0	3	0	742	0	0	742	0	0	1	0	1	1311
% Pass Veh	0	98.8	0	99.1	98.9	50.0	0	100	0	75.0	0	99.1	0	0	99.1	0	0	100	0	33.3	98.8
Heavy Veh	0	2	0	3	5	1	0	0	0	1	0	5	0	0	5	1	1	0	0	2	13
% Heavy Veh	0	0.8	0	0.9	0.9	50.0	0	0	0	25.0	0	0.7	0	0	0.7	100	100	0	0	66.7	1.0
School Bus	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	3
% School Bus	0	0.4	0	0	0.2	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.2



PM

Dwy 2 - East
(North Loop Drwy)

DPR
5/6/09

Vehicle Turn Movements

time	# of vehicles LEFT IN	# of vehicles RIGHT IN	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

time	# of vehicles LEFT OUT	# of vehicles RIGHT OUT	# of vehicles
4:00			
05			
10			
15			
20		III	
25			
30		I	
35			
40			
45	I		
50			
55			
5:00			
05			
10			
15			
20			
25			
30		I	
35			
40			
45			
50			
55			

CME
CREIGHTON MANNING ENGINEERING, LLP

Dwy 2 - East

PM

Drury Inn West
(North Loop Drury)

DPR
5/6/09

Vehicle Turn Movements

time	# of vehicles LEFT IN	# of vehicles RIGHT IN	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40	11		
45			
50		1	
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50		1	
55		1	

time	# of vehicles LEFT OUT	# of vehicles RIGHT OUT	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

CME
CREIGHTON MANNING ENGINEERING, LLP

Dwy 4 - East

(SOUTH LOOP DWY 4)

PM

DPR

Vehicle Turn Movements

time	# of vehicles LEFT IN	# of vehicles RIGHT IN	# of vehicles
4:00			
05			
10			
15			
20		1	
25			
30			
35			
40			
45		1	
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

time	# of vehicles LEFT OUT	# of vehicles RIGHT OUT	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

CME
CREIGHTON MANNING ENGINEERING, LLP

Dwy 4 East

Vehicle Turn Movements

DPR

time	# of vehicles LEFT IN	# of vehicles RIGHT IN	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

time	# of vehicles LEFT OUT	# of vehicles RIGHT OUT	# of vehicles
4:00			
05			
10			
15			
20			
25			
30			
35			
40	1		
45			
50			
55			
5:00			
05			
10			
15			
20			
25			
30			
35			
40			
45			
50			
55			

CREIGHTON MANNING ENGINEERING, LLP

Project: 09-024d
Counted By: DDD
Location: Ulster, NY
Other:

File Name : tm09024p6
Site Code : 09-024-6
Start Date : 5/6/2009
Page No : 1

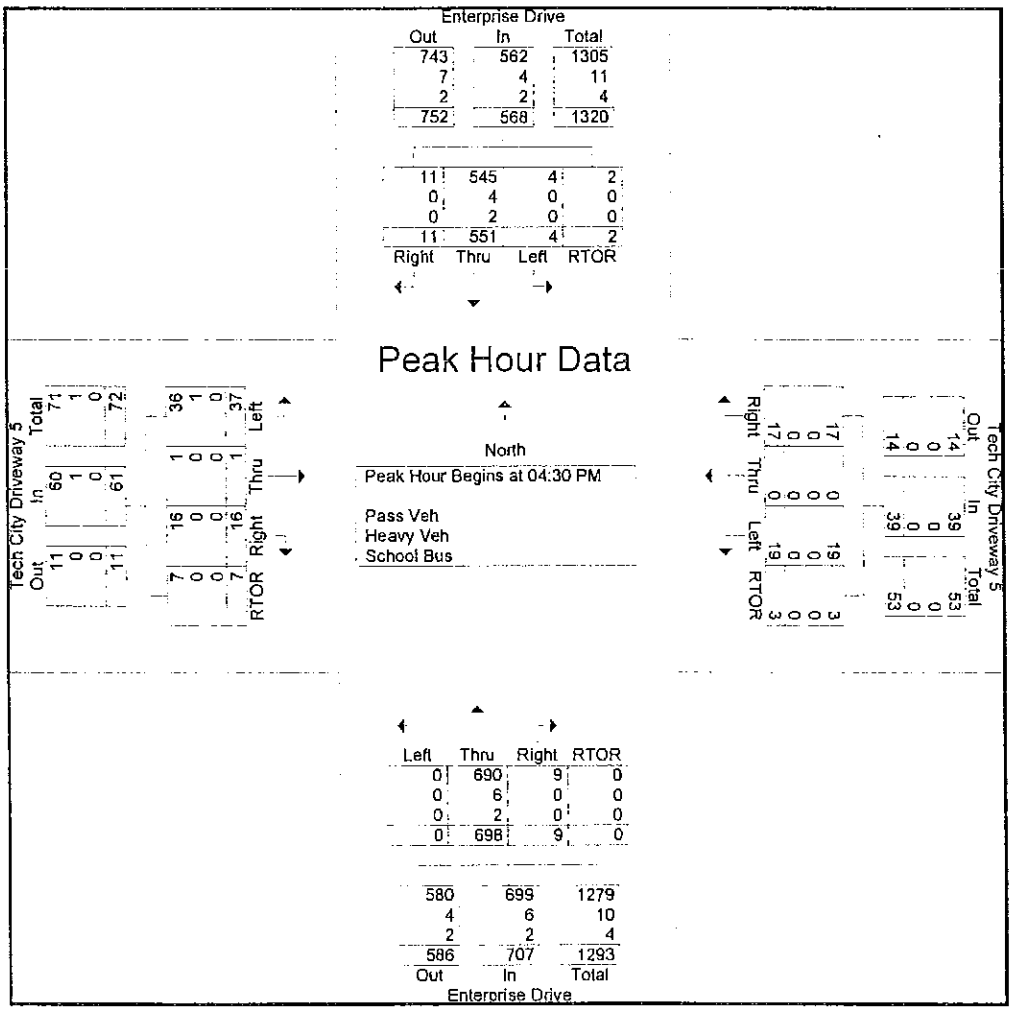
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Enterprise Drive Southbound					Tech City Driveway 5 Westbound					Enterprise Drive Northbound					Tech City Driveway 5 Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	0	123	2	1	126	2	2	2	0	6	0	124	1	0	125	16	0	5	5	26	283
04:15 PM	2	108	3	0	113	1	0	1	0	2	0	166	4	0	170	9	1	5	2	17	302
04:30 PM	1	105	2	0	108	12	0	12	1	25	0	199	4	0	203	24	0	9	3	36	372
04:45 PM	1	138	4	2	145	5	0	3	2	10	0	172	1	0	173	7	1	2	2	12	340
Total	4	474	11	3	492	20	2	18	3	43	0	661	10	0	671	56	2	21	12	91	1297
05:00 PM	2	143	4	0	149	1	0	1	0	2	0	185	1	0	186	4	0	4	2	10	347
05:15 PM	0	165	1	0	166	1	0	1	0	2	0	142	3	0	145	2	0	1	0	3	316
05:30 PM	1	145	0	0	146	7	0	2	0	9	0	118	2	0	120	3	0	3	0	6	281
05:45 PM	1	143	1	0	145	4	0	1	0	5	0	117	0	0	117	3	0	0	0	3	270
Total	4	596	6	0	606	13	0	5	0	18	0	562	6	0	568	12	0	8	2	22	1214
Grand Total	8	1070	17	3	1098	33	2	23	3	61	0	1223	16	0	1239	68	2	29	14	113	2511
Apprch %	0.7	97.4	1.5	0.3		54.1	3.3	37.7	4.9		0	98.7	1.3	0		60.2	1.8	25.7	12.4		
Total %	0.3	42.6	0.7	0.1	43.7	1.3	0.1	0.9	0.1	2.4	0	48.7	0.6	0	49.3	2.7	0.1	1.2	0.6	4.5	
Pass Veh	8	1048	17	3	1076	33	2	23	3	61	0	1210	16	0	1226	67	1	29	13	110	2473
% Pass Veh	100	97.9	100	100	98	100	100	100	100	100	0	98.9	100	0	99	98.5	50	100	92.9	97.3	98.5
Heavy Veh	0	15	0	0	15	0	0	0	0	0	0	10	0	0	10	1	1	0	1	3	28
% Heavy Veh	0	1.4	0	0	1.4	0	0	0	0	0	0	0.8	0	0	0.8	1.5	50	0	7.1	2.7	1.1
School Bus	0	7	0	0	7	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	10
% School Bus	0	0.7	0	0	0.6	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0.4

Project: 09-024d
Counted By: DDD
Location: Ulster, NY
Other:

File Name : tm09024p6
Site Code : 09-024-6
Start Date : 5/6/2009
Page No : 2

	Enterprise Drive Southbound					Tech City Driveway 5 Westbound					Enterprise Drive Northbound					Tech City Driveway 5 Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:30:00 PM																					
4:30:00 PM	1	105	2	0	108	12	0	12	1	25	0	199	4	0	203	24	0	9	3	36	372
4:45:00 PM	1	138	4	2	145	5	0	3	2	10	0	172	1	0	173	7	1	2	2	12	340
5:00:00 PM	2	143	4	0	149	1	0	1	0	2	0	185	1	0	186	4	0	4	2	10	347
5:15:00 PM	0	165	1	0	166	1	0	1	0	2	0	142	3	0	145	2	0	1	0	3	316
Total Volume	4	551	11	2	568	19	0	17	3	39	0	698	9	0	707	37	1	16	7	61	1375
% App. Total	0.7	97	1.9	0.4		48.7	0	43.6	7.7		0	98.7	1.3	0		60.7	1.6	26.2	11.5		
PHF	.500	.835	.688	.250	.855	.396	.000	.354	.375	.390	.000	.877	.563	.000	.871	.385	.250	.444	.583	.424	.924
Pass Veh	4	545	11	2	562	19	0	17	3	39	0	690	9	0	699	36	1	16	7	60	1360
% Pass Veh	100	98.9	100	100	98.9	100	0	100	100	100	0	98.9	100	0	98.9	97.3	100	100	100	98.4	98.9
Heavy Veh	0	4	0	0	4	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	11
% Heavy Veh	0	0.7	0	0	0.7	0	0	0	0	0	0	0.9	0	0	0.8	2.7	0	0	0	1.6	0.8
School Bus	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
% School Bus	0	0.4	0	0	0.4	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0.3



Project: 09-024d
Counted By: DDD
Location: Ulster, NY
Other:

File Name : tm09024p5
Site Code : 09-024-5
Start Date : 4/28/2009
Page No : 1

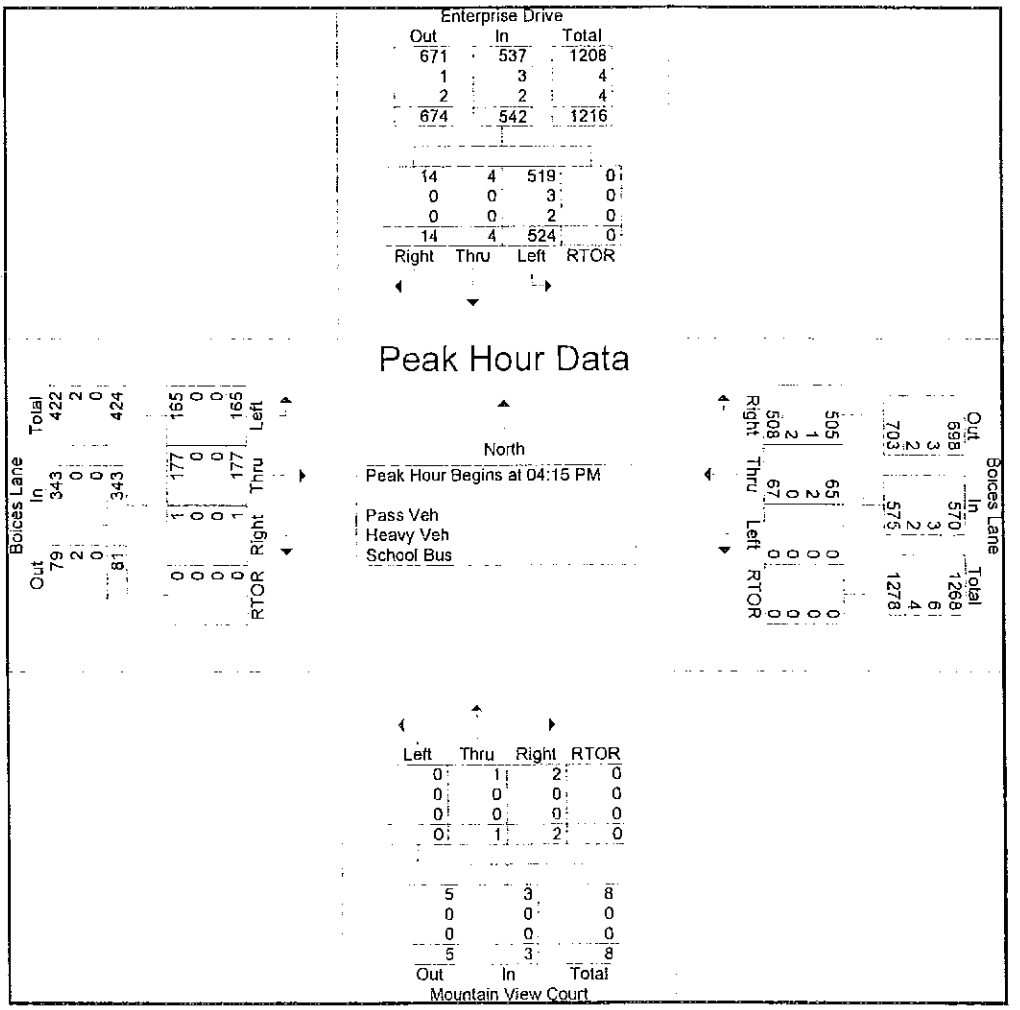
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Enterprise Drive Southbound					Boices Lane Westbound					Mountain View Court Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	148	0	3	0	151	0	10	123	0	133	0	0	0	0	0	11	14	0	0	25	309
04:15 PM	108	1	5	0	114	0	14	129	0	143	0	0	0	0	0	22	22	0	0	44	301
04:30 PM	146	1	2	0	149	0	13	117	0	130	0	1	0	0	1	76	84	0	0	160	440
04:45 PM	129	1	4	0	134	0	22	125	0	147	0	0	1	0	1	42	44	1	0	87	369
Total	531	3	14	0	548	0	59	494	0	553	0	1	1	0	2	151	164	1	0	316	1419
05:00 PM	141	1	3	0	145	0	18	137	0	155	0	0	1	0	1	25	27	0	0	52	353
05:15 PM	110	2	6	0	118	0	5	120	0	125	0	0	0	0	0	17	16	0	0	33	276
05:30 PM	129	0	3	0	132	0	9	109	0	118	0	0	0	0	0	22	12	0	0	34	284
05:45 PM	122	3	2	0	127	2	8	100	0	110	0	4	0	0	4	10	9	1	0	20	261
Total	502	6	14	0	522	2	40	466	0	508	0	4	1	0	5	74	64	1	0	139	1174
Grand Total	1033	9	28	0	1070	2	99	960	0	1061	0	5	2	0	7	225	228	2	0	455	2593
Apprch %	96.5	0.8	2.6	0		0.2	9.3	90.5	0		0	71.4	28.6	0		49.5	50.1	0.4	0		
Total %	39.8	0.3	1.1	0	41.3	0.1	3.8	37	0	40.9	0	0.2	0.1	0	0.3	8.7	8.8	0.1	0	17.5	
Pass Veh	1017	9	28	0	1054	2	95	957	0	1054	0	5	2	0	7	225	228	2	0	455	2570
% Pass Veh	98.5	100	100	0	98.5	100	96	99.7	0	99.3	0	100	100	0	100	100	100	100	0	100	99.1
Heavy Veh	11	0	0	0	11	0	4	1	0	5	0	0	0	0	0	0	0	0	0	0	16
% Heavy Veh	1.1	0	0	0	1	0	4	0.1	0	0.5	0	0	0	0	0	0	0	0	0	0	0.6
School Bus	5	0	0	0	5	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	7
% School Bus	0.5	0	0	0	0.5	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0.3

Project: 09-024d
Counted By: DDD
Location: Ulster, NY
Other:

File Name : tm09024p5
Site Code : 09-024-5
Start Date : 4/28/2009
Page No : 2

	Enterprise Drive Southbound					Boices Lane Westbound					Mountain View Court Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:15:00 PM																					
4:15:00 PM	108	1	5	0	114	0	14	129	0	143	0	0	0	0	0	22	22	0	0	44	301
4:30:00 PM	146	1	2	0	149	0	13	117	0	130	0	1	0	0	1	76	84	0	0	160	440
4:45:00 PM	129	1	4	0	134	0	22	125	0	147	0	0	1	0	1	42	44	1	0	87	369
5:00:00 PM	141	1	3	0	145	0	18	137	0	155	0	0	1	0	1	25	27	0	0	52	353
Total Volume	524	4	14	0	542	0	67	508	0	575	0	1	2	0	3	165	177	1	0	343	1463
% App. Total	96.7	0.7	2.6	0		0	11.7	88.3	0		0	33.3	66.7	0		48.1	51.6	0.3	0		
PHF	.897	1.000	.700	.000	.909	.000	.761	.927	.000	.927	.000	.250	.500	.000	.750	.543	.527	.250	.000	.536	.831
Pass Veh	519	4	14	0	537	0	65	505	0	570	0	1	2	0	3	165	177	1	0	343	1453
% Pass Veh	99.0	100	100	0	99.1	0	97.0	99.4	0	99.1	0	100	100	0	100	100	100	100	0	100	99.3
Heavy Veh	3	0	0	0	3	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	6
% Heavy Veh	0.6	0	0	0	0.6	0	3.0	0.2	0	0.5	0	0	0	0	0	0	0	0	0	0	0.4
School Bus	2	0	0	0	2	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	4
% School Bus	0.4	0	0	0	0.4	0	0	0.4	0	0.3	0	0	0	0	0	0	0	0	0	0	0.3



Project: 09-024d
Counted By: DAT
Location: Ulster, NY
Other:

File Name : tm09024p4
Site Code : 09-024-4
Start Date : 4/28/2009
Page No : 1

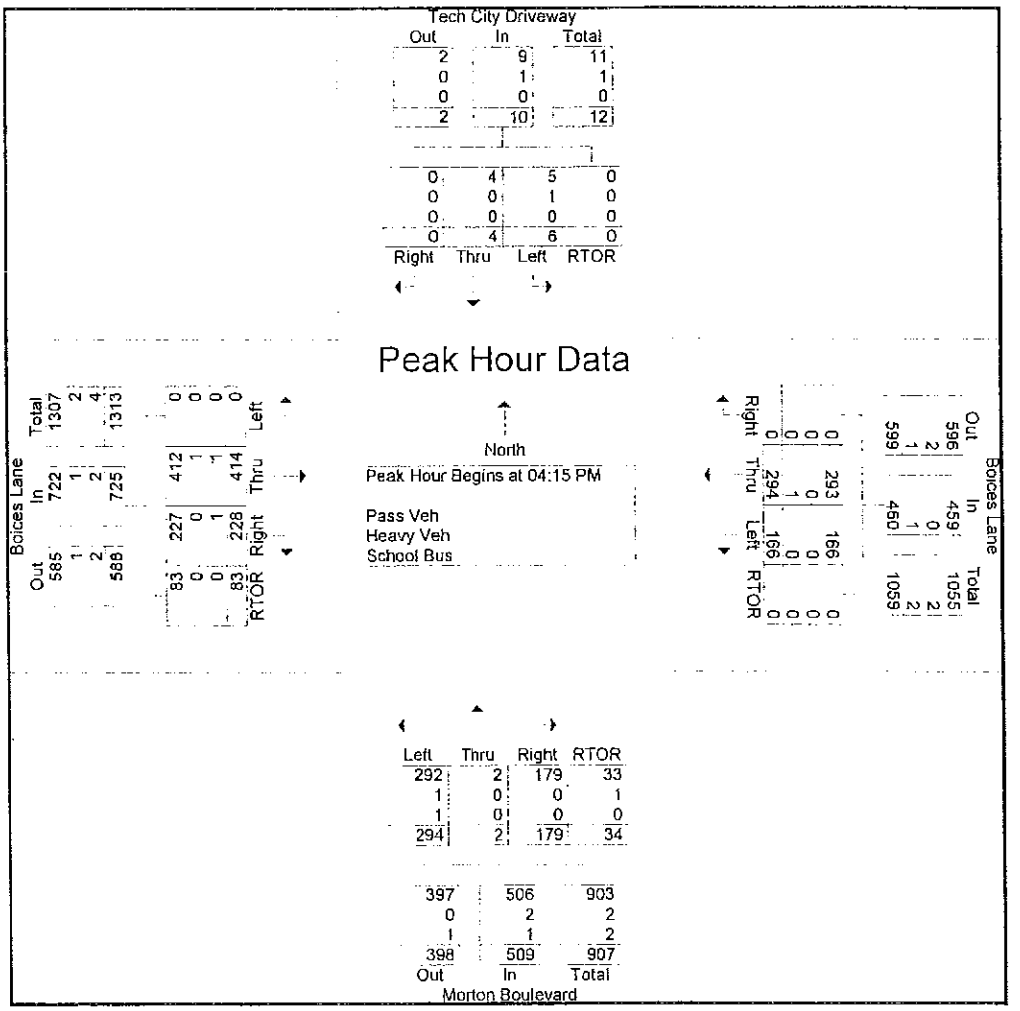
Groups Printed- Pass Veh - Heavy Veh - School Bus

	Tech City Driveway Southbound					Boices Lane Westbound					Morton Boulevard Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Rignt	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	0	0	0	0	0	50	77	0	0	127	70	2	30	13	115	0	75	49	21	145	387
04:15 PM	0	1	0	0	1	39	54	0	0	93	71	0	45	13	129	0	87	40	16	143	366
04:30 PM	5	0	0	0	5	43	74	0	0	117	77	1	38	6	122	0	125	77	26	228	472
04:45 PM	1	2	0	0	3	40	89	0	0	129	59	0	52	8	119	0	99	54	19	172	423
Total	6	3	0	0	9	172	294	0	0	466	277	3	165	40	485	0	386	220	82	688	1648
05:00 PM	0	1	0	0	1	44	77	0	0	121	87	1	44	7	139	0	103	57	22	182	443
05:15 PM	1	0	0	0	1	55	65	0	0	120	63	1	32	16	112	0	72	37	16	125	358
05:30 PM	1	0	0	0	1	30	71	2	0	103	58	0	31	9	98	0	77	44	22	143	345
05:45 PM	0	0	0	0	0	39	78	0	0	117	47	0	43	3	93	1	77	76	4	158	368
Total	2	1	0	0	3	168	291	2	0	461	255	2	150	35	442	1	329	214	64	608	1514
Grand Total	8	4	0	0	12	340	585	2	0	927	532	5	315	75	927	1	715	434	146	1296	3162
Apprch %	66.7	33.3	0	0		36.7	63.1	0.2	0		57.4	0.5	34	8.1		0.1	55.2	33.5	11.3		
Total %	0.3	0.1	0	0	0.4	10.8	18.5	0.1	0	29.3	16.8	0.2	10	2.4	29.3	0	22.6	13.7	4.6	41	
Pass Veh	7	4	0	0	11	340	584	2	0	926	529	5	315	74	923	1	711	428	146	1286	3146
% Pass Veh	87.5	100	0	0	91.7	100	99.8	100	0	99.9	99.4	100	100	98.7	99.6	100	99.4	98.6	100	99.2	99.5
Heavy Veh	1	0	0	0	1	0	0	0	0	0	2	0	0	1	3	0	2	2	0	4	8
% Heavy Veh	12.5	0	0	0	8.3	0	0	0	0	0	0.4	0	0	1.3	0.3	0	0.3	0.5	0	0.3	0.3
School Bus	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	2	4	0	6	8
% School Bus	0	0	0	0	0	0	0.2	0	0	0.1	0.2	0	0	0	0.1	0	0.3	0.9	0	0.5	0.3

Project: 09-024d
Counted By: DAT
Location: Ulster, NY
Other:

File Name : tm09024p4
Site Code : 09-024-4
Start Date : 4/28/2009
Page No : 2

	Tech City Driveway Southbound					Boices Lane Westbound					Morton Boulevard Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:15:00 PM																					
4:15:00 PM	0	1	0	0	1	39	54	0	0	93	71	0	45	13	129	0	87	40	16	143	366
4:30:00 PM	5	0	0	0	5	43	74	0	0	117	77	1	38	6	122	0	125	77	26	228	472
4:45:00 PM	1	2	0	0	3	40	89	0	0	129	59	0	52	8	119	0	99	54	19	172	423
5:00:00 PM	0	1	0	0	1	44	77	0	0	121	87	1	44	7	139	0	103	57	22	182	443
Total Volume	6	4	0	0	10	166	294	0	0	460	294	2	179	34	509	0	414	228	83	725	1704
% App. Total	60	40	0	0		36.1	63.9	0	0		57.8	0.4	35.2	6.7		0	57.1	31.4	11.4		
PHF	.300	.500	.000	.000	.500	.943	.826	.000	.000	.891	.845	.500	.861	.654	.915	.000	.828	.740	.798	.795	.903
Pass Veh	5	4	0	0	9	166	293	0	0	459	292	2	179	33	506	0	412	227	83	722	1696
% Pass Veh	83.3	100	0	0	90.0	100	99.7	0	0	99.8	99.3	100	100	97.1	99.4	0	99.5	99.6	100	99.6	99.5
Heavy Veh	1	0	0	0	1	0	0	0	0	0	1	0	0	1	2	0	1	0	0	1	4
% Heavy Veh	16.7	0	0	0	10.0	0	0	0	0	0	0.3	0	0	2.9	0.4	0	0.2	0	0	0.1	0.2
School Bus	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	1	1	0	2	4
% School Bus	0	0	0	0	0	0	0.3	0	0	0.2	0.3	0	0	0	0.2	0	0.2	0.4	0	0.3	0.2



Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm09024p3
Site Code : 09-024-3
Start Date : 4/28/2009
Page No : 1

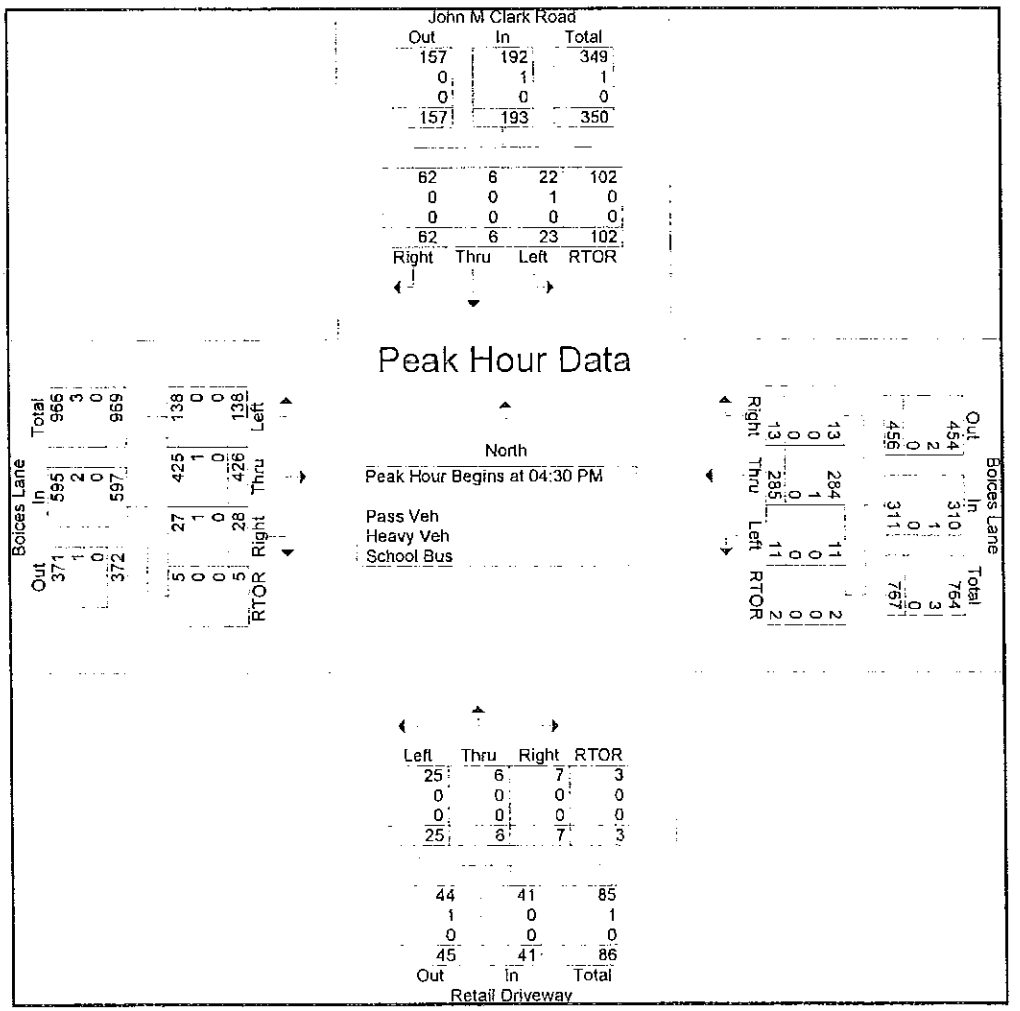
Groups Printed- Pass Veh - Heavy Veh - School Bus

	John M Clark Road Southbound					Boices Lane Westbound					Retail Driveway Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Factor	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0		
04:00 PM	7	4	25	28	64	4	76	5	0	85	4	1	1	1	7	19	97	8	0	124	280
04:15 PM	5	4	14	28	51	0	47	2	0	49	7	0	3	1	11	33	96	7	0	136	247
04:30 PM	11	1	13	21	46	0	71	4	0	75	4	2	2	0	8	37	127	4	0	168	297
04:45 PM	5	2	18	22	47	4	81	6	0	91	4	1	2	0	7	42	110	12	1	165	310
Total	28	11	70	99	208	8	275	17	0	300	19	4	8	2	33	131	430	31	1	593	1134
05:00 PM	3	0	10	33	46	3	66	0	1	70	7	1	0	1	9	31	94	5	4	134	259
05:15 PM	4	3	21	26	54	4	67	3	1	75	10	2	3	2	17	28	95	7	0	130	276
05:30 PM	4	0	13	26	43	2	58	6	0	66	4	2	2	2	10	28	87	5	1	121	240
05:45 PM	3	1	8	20	32	3	68	6	1	78	7	2	0	1	10	19	86	4	1	110	230
Total	14	4	52	105	175	12	259	15	3	289	28	7	5	6	46	106	362	21	6	495	1005
Grand Total	42	15	122	204	383	20	534	32	3	589	47	11	13	8	79	237	792	52	7	1088	2139
Apprch %	11	3.9	31.9	53.3		3.4	90.7	5.4	0.5		59.5	13.9	16.5	10.1		21.8	72.8	4.8	0.6		
Total %	2	0.7	5.7	9.5	17.9	0.9	25	1.5	0.1	27.5	2.2	0.5	0.6	0.4	3.7	11.1	37	2.4	0.3	50.9	
Pass Veh	40	15	122	204	381	20	532	31	3	586	47	11	13	8	79	237	785	51	7	1080	2126
% Pass Veh	95.2	100	100	100	99.5	100	99.6	96.9	100	99.5	100	100	100	100	100	100	99.1	98.1	100	99.3	99.4
Heavy Veh	2	0	0	0	2	0	1	1	0	2	0	0	0	0	0	0	6	1	0	7	11
% Heavy Veh	4.8	0	0	0	0.5	0	0.2	3.1	0	0.3	0	0	0	0	0	0	0.8	1.9	0	0.6	0.5
School Bus	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% School Bus	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0.1

Project: 09-024d
Counted By: DPR
Location: Ulster, NY
Other:

File Name : tm09024p3
Site Code : 09-024-3
Start Date : 4/28/2009
Page No : 2

	John M Clark Road Southbound					Boices Lane Westbound					Retail Driveway Northbound					Boices Lane Eastbound					
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Int. Total
Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 4:30:00 PM																					
4:30:00 PM	11	1	13	21	46	0	71	4	0	75	4	2	2	0	8	37	127	4	0	168	297
4:45:00 PM	5	2	18	22	47	4	81	6	0	91	4	1	2	0	7	42	110	12	1	165	310
5:00:00 PM	3	0	10	33	46	3	66	0	1	70	7	1	0	1	9	31	94	5	4	134	259
5:15:00 PM	4	3	21	26	54	4	67	3	1	75	10	2	3	2	17	28	95	7	0	130	276
Total Volume	23	6	62	102	193	11	285	13	2	311	25	6	7	3	41	138	426	28	5	597	1142
% App. Total	11.9	3.1	32.1	52.8		3.5	91.6	4.2	0.6		61	14.6	17.1	7.3		23.1	71.4	4.7	0.8		
PHF	.523	.500	.738	.773	.894	.688	.880	.542	.500	.854	.625	.750	.583	.375	.603	.821	.839	.583	.313	.888	.921
Pass Veh	22	6	62	102	192	11	284	13	2	310	25	6	7	3	41	138	425	27	5	595	1138
% Pass Veh	95.7	100	100	100	99.5	100	99.6	100	100	99.7	100	100	100	100	100	100	99.8	96.4	100	99.7	99.6
Heavy Veh	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	1	1	0	2	4
% Heavy Veh	4.3	0	0	0	0.5	0	0.4	0	0	0.3	0	0	0	0	0	0	0.2	3.6	0	0.3	0.4
School Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% School Bus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



Appendix C – Automatic Traffic Recorder Data

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

MetroCount Traffic Executive
Weekly Event Counts

WeeklyEvent-794 -- English (ENU)

Datasets:

Site:	**[09-024d] Enterprise Drive - NB Lanes**
Input A:	1 - North bound. - Added to totals. (1)
Input B:	3 - South bound. - Excluded from totals. (0)
Survey Duration:	11:00 Tuesday, April 28, 2009 => 8:58 Thursday, May 07, 2009
File:	C:\Documents and Settings\dreynolds\Desktop\ATR Unload\09-024d07May2009EnterpriseDr.EC0
(Plus)	
Identifier:	R7190MC2 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Split (Count)

Profile:

Filter time:	**13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Name:	Factory default profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 112341 / 113181 (99.26%)

Weekly Event Counts

'leeklyEvent-794
Site: 09-024d.0N
Description: **Enterprise Drive - NB Lanes**
Filter time: **13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Scheme: Count events divided by two.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	27 Apr	28 Apr	29 Apr	30 Apr	01 May	02 May	03 May	1 - 5	1 - 7
Hour									
0000-0100	*	*	29	31	35	37	40	31.7	34.4
0100-0200	*	*	20	12	11	17	17	14.3	15.4
0200-0300	*	*	9	7	9	14	8	8.3	9.4
0300-0400	*	*	13	10	10	11	6	11.0	10.0
0400-0500	*	*	9	7	11	12	4	9.0	8.6
0500-0600	*	*	41	50	40	25	24	43.7	36.0
0600-0700	*	*	132	114	129	109	56	125.0	108.0
0700-0800	*	*	333	**410<**	384	209	64	375.7	280.0
0800-0900	*	*	342	306	352	254	118	333.3	274.4
0900-1000	*	*	269	301	293	384	166	287.7	282.6
1000-1100	*	*	356	314	345	493	234	338.3	348.4
1100-1200	*	*	**393<**	352	**416<**	**632<**	**282<**	**387.0<**	**415.0<**
1200-1300	*	*	459	533	473	**675<**	347	488.3	497.4
1300-1400	*	478	508	546	535	671	320	516.8	509.7
1400-1500	*	606	622	615	667	593	**384<**	627.5	581.2
1500-1600	*	809	879	778	867	574	374	833.3	713.5
1600-1700	*	938	**1006<**	**932<**	**1035<**	463	352	**977.8<**	**787.7<**
1700-1800	*	700	842	798	776	398	352	779.0	644.3
1800-1900	*	511	570	594	476	389	276	537.8	469.3
1900-2000	*	414	407	351	462	315	233	408.5	363.7
2000-2100	*	338	387	326	367	256	185	354.5	309.8
2100-2200	*	224	210	210	320	183	111	241.0	209.7
2200-2300	*	163	174	153	202	115	75	173.0	147.0
2300-2400	*	40	57	63	82	81	28	60.5	58.5
Totals									
0700-1900	*	*	6579	6479	6619	5735	3269	6482.3	5803.5
0600-2200	*	*	7715	7480	7897	6598	3854	7611.3	6794.6
0600-0000	*	*	7946	7696	8181	6794	3957	7844.8	7000.1
0000-0000	*	*	8067	7813	8297	6910	4056	7962.8	7113.9
AM Peak	*	*	1100	0700	1100	1100	1100		
	*	*	393	410	416	632	282		
PM Peak	*	*	1600	1600	1600	1200	1400		
	*	*	1006	932	1035	675	384		

* - No data.

Weekly Event Counts

WeeklyEvent-794
Site: 09-024d.0N
Description: Enterprise Drive - NB Lanes
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Count events divided by two.

	Mon 04 May	Tue 05 May	Wed 06 May	Thu 07 May	Fri 08 May	Sat 09 May	Sun 10 May	Averages 1 - 5	1 - 7
Hour									
0000-0100	9	33	37	*	*	*	*	26.3	26.3
0100-0200	14	5	11	*	*	*	*	10.0	10.0
0200-0300	7	13	5	*	*	*	*	8.3	8.3
0300-0400	7	8	6	*	*	*	*	7.0	7.0
0400-0500	4	8	14	*	*	*	*	8.7	8.7
0500-0600	42	49	53	*	*	*	*	48.0	48.0
0600-0700	141	131	147	*	*	*	*	139.7	139.7
0700-0800	380<	379<	392	*	*	*	*	383.7<	383.7<
0800-0900	284	319	298	*	*	*	*	300.3	300.3
0900-1000	255	286	267	*	*	*	*	269.3	269.3
1000-1100	322	321	374	*	*	*	*	339.0	339.0
1100-1200	375	370	398<	*	*	*	*	381.0	381.0
1200-1300	470	522	515	*	*	*	*	502.3	502.3
1300-1400	525	500	500	*	*	*	*	508.3	508.3
1400-1500	644	606	*	*	*	*	*	625.0	625.0
1500-1600	782	751	*	*	*	*	*	766.5	766.5
1600-1700	955<	870<	*	*	*	*	*	912.5<	912.5<
1700-1800	711	719	*	*	*	*	*	715.0	715.0
1800-1900	494	469	*	*	*	*	*	481.5	481.5
1900-2000	347	345	*	*	*	*	*	346.0	346.0
2000-2100	302	289	*	*	*	*	*	295.5	295.5
2100-2200	167	176	*	*	*	*	*	171.5	171.5
2200-2300	92	122	*	*	*	*	*	107.0	107.0
2300-2400	57	44	*	*	*	*	*	50.5	50.5
Totals									
0700-1900	6197	6112	*	*	*	*	*	6184.5	6184.5
0600-2200	7154	7053	*	*	*	*	*	7137.2	7137.2
0600-0000	7303	7219	*	*	*	*	*	7294.7	7294.7
0000-0000	7386	7335	*	*	*	*	*	7403.0	7403.0
AM Peak	0700	0700	1100	*	*	*	*		
	380	379	398	*	*	*	*		
PM Peak	1600	1600	*	*	*	*	*		
	955	870	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Event Counts

WeeklyEvent-795 -- English (ENU)

Datasets:

Site:	**[09-024d] Enterprise Drive - SB Lanes**
Input A:	1 - North bound. - Excluded from totals. (0)
Input B:	3 - South bound. - Added to totals. (1)
Survey Duration:	11:00 Tuesday, April 28, 2009 => 8:58 Thursday, May 07, 2009
File:	C:\Documents and Settings\dreynolds\Desktop\ATR Unload\09-024d07May2009EnterpriseDr.EC0
(Plus)	
Identifier:	R7190MC2 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Split (Count)

Profile:

Filter time:	**13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Name:	Factory default profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 112341 / 113181 (99.26%)

Weekly Event Counts

WeeklyEvent-795
Site: 09-024d.0N
Description: Enterprise Drive - SB Lanes
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Count events divided by two.

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	27 Apr	28 Apr	29 Apr	30 Apr	01 May	02 May	03 May	1 - 5	1 - 7
Hour									
0000-0100	*	*	13	8	13	28	37	11.3	19.8
0100-0200	*	*	11	7	4	13	21	7.3	11.2
0200-0300	*	*	13	7	7	12	8	9.0	9.4
0300-0400	*	*	7	12	9	12	7	9.3	9.4
0400-0500	*	*	16	22	18	10	8	18.7	14.8
0500-0600	*	*	90	107	77	24	22	91.3	64.0
0600-0700	*	*	317	291	339	90	58	315.7	219.0
0700-0800	*	*	**783<**	**761<**	**694<**	242	105	**746.0<**	**517.0<**
0800-0900	*	*	560	608	587	403	164	585.0	464.4
0900-1000	*	*	462	451	447	526	227	453.3	422.6
1000-1100	*	*	372	403	419	639	290	398.0	424.6
1100-1200	*	*	504	451	502	**688<**	**350<**	485.7	499.0
1200-1300	*	*	485	490	532	**605<**	382	502.3	498.8
1300-1400	*	433	464	424	533	565	**432<**	463.5	475.2
1400-1500	*	458	469	440	505	467	363	468.0	450.3
1500-1600	*	614	637	**589<**	**642<**	494	280	**620.5<**	**542.7<**
1600-1700	*	553	567	571	592	427	269	570.8	496.5
1700-1800	*	543	**693<**	584	597	387	230	604.3	505.7
1800-1900	*	328	465	368	424	334	194	396.3	352.2
1900-2000	*	240	286	250	292	212	150	267.0	238.3
2000-2100	*	153	194	242	176	183	145	191.3	182.2
2100-2200	*	97	84	74	122	127	50	94.3	92.3
2200-2300	*	57	57	61	77	66	44	63.0	60.3
2300-2400	*	37	55	43	60	57	40	48.8	48.7
Totals									
0700-1900	*	*	6461	6140	6474	5777	3286	6293.6	5648.9
0600-2200	*	*	7342	6997	7403	6389	3689	7161.8	6380.7
0600-0000	*	*	7454	7101	7540	6512	3773	7273.5	6489.7
0000-0000	*	*	7604	7264	7668	6611	3876	7420.5	6618.3
AM Peak	*	*	0700	0700	0700	1100	1100		
	*	*	783	761	694	688	350		
PM Peak	*	*	1700	1500	1500	1200	1300		
	*	*	693	589	642	605	432		

* - No data.

Weekly Event Counts

WeeklyEvent-795
Site: 09-024d.0N
Description: Enterprise Drive - SB Lanes
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Count events divided by two.

	Mon 04 May	Tue 05 May	Wed 06 May	Thu 07 May	Fri 08 May	Sat 09 May	Sun 10 May	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	10	10	13	*	*	*	*	11.0	11.0
0100-0200	6	9	4	*	*	*	*	6.3	6.3
0200-0300	3	4	11	*	*	*	*	6.0	6.0
0300-0400	11	12	8	*	*	*	*	10.3	10.3
0400-0500	11	24	14	*	*	*	*	16.3	16.3
0500-0600	93	94	101	*	*	*	*	96.0	96.0
0600-0700	338	322	301	*	*	*	*	320.3	320.3
0700-0800	709<	715<	725<	*	*	*	*	716.3<	716.3<
0800-0900	589	521	565	*	*	*	*	558.3	558.3
0900-1000	407	464	428	*	*	*	*	433.0	433.0
1000-1100	418	375	397	*	*	*	*	396.7	396.7
1100-1200	462	422	431	*	*	*	*	438.3	438.3
1200-1300	428	477	490	*	*	*	*	465.0	465.0
1300-1400	461	422	420	*	*	*	*	434.3	434.3
1400-1500	461	448	*	*	*	*	*	454.5	454.5
1500-1600	596<	621<	*	*	*	*	*	608.5<	608.5<
1600-1700	483	496	*	*	*	*	*	489.5	489.5
1700-1800	540	516	*	*	*	*	*	528.0	528.0
1800-1900	369	331	*	*	*	*	*	350.0	350.0
1900-2000	255	201	*	*	*	*	*	228.0	228.0
2000-2100	125	162	*	*	*	*	*	143.5	143.5
2100-2200	88	78	*	*	*	*	*	83.0	83.0
2200-2300	54	57	*	*	*	*	*	55.5	55.5
2300-2400	55	42	*	*	*	*	*	48.5	48.5
Totals									
0700-1900	5923	5808	*	*	*	*	*	5872.5	5872.5
0600-2200	6729	6571	*	*	*	*	*	6647.3	6647.3
0600-0000	6838	6670	*	*	*	*	*	6751.3	6751.3
0000-0000	6972	6823	*	*	*	*	*	6897.3	6897.3
AM Peak	0700	0700	0700	*	*	*	*		
	709	715	725	*	*	*	*		
PM Peak	1500	1500	*	*	*	*	*		
	596	621	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-796 -- English (ENU)

Datasets:

Site:	**[09-024d] Boices Lane - Just East of Dalewood St**
Direction:	8 - East bound A>B, West bound B>A., **Lane:** 0
Survey Duration:	11:00 Tuesday, April 28, 2009 => 9:03 Thursday, May 07, 2009
File:	C:\Documents and Settings\dreynolds\Desktop\ATR Unload\09-024d07May2009BoicesLn.EC0 (Plus)
Identifier:	R519M98M MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class, Speed, Count)

Profile:

Filter time:	**13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	5 - 100 mph.
Direction:	East, West (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (Scheme F2)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 102821 / 105075 (97.85%)

Weekly Vehicle Counts

WeeklyVehicle-796
Site: 09-024d.0WE
Description: Boices Lane - Just East of Dalewood St
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(EW) Sp(5,100) Sep(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	27 Apr	28 Apr	29 Apr	30 Apr	01 May	02 May	03 May	1 - 5	1 - 7
Hour									
0000-0100	*	*	36	36	43	62	58	38.3	47.0
0100-0200	*	*	20	22	14	29	35	18.7	24.0
0200-0300	*	*	27	14	23	13	23	21.3	20.0
0300-0400	*	*	28	29	27	18	14	28.0	23.2
0400-0500	*	*	22	28	36	24	20	28.7	26.0
0500-0600	*	*	139	151	116	43	42	135.3	98.2
0600-0700	*	*	383	345	403	157	105	377.0	278.6
0700-0800	*	*	841	**926<**	857	382	155	**874.7<**	632.2
0800-0900	*	*	837	858	838	606	275	844.3	682.8
0900-1000	*	*	707	698	703	831	383	702.7	664.4
1000-1100	*	*	680	705	743	1014	477	709.3	723.8
1100-1200	*	*	**860<**	789	**910<**	**1155<**	**591<**	853.0	**861.0<**
1200-1300	*	*	959	1036	1080	1036	695	1025.0	961.2
1300-1400	*	854	919	929	1083	**1090<**	**722<**	946.3	932.8
1400-1500	*	951	1010	922	1107	949	695	997.5	939.0
1500-1600	*	1190	1275	1199	1384	970	612	1262.0	1105.0
1600-1700	*	1260	**1320<**	**1329<**	**1395<**	816	604	**1326.0<**	**1120.7<**
1700-1800	*	1122	1301	1252	1285	731	555	1240.0	1041.0
1800-1900	*	778	955	881	916	692	459	882.5	780.2
1900-2000	*	627	643	605	730	504	369	651.3	579.7
2000-2100	*	435	517	548	524	411	302	506.0	456.2
2100-2200	*	284	312	259	418	323	162	318.3	293.0
2200-2300	*	179	226	193	238	166	111	209.0	185.5
2300-2400	*	72	107	100	129	132	68	102.0	101.3
Totals									
0700-1900	*	*	11664	11524	12301	10272	6223	11663.3	10444.1
0600-2200	*	*	13519	13281	14376	11667	7161	13515.8	12051.5
0600-0000	*	*	13852	13574	14743	11965	7340	13826.8	12338.3
0000-0000	*	*	14124	13854	15002	12154	7532	14097.1	12576.7
AM Peak	*	*	1100	0700	1100	1100	1100		
	*	*	860	926	910	1155	591		
PM Peak	*	*	1600	1600	1600	1300	1300		
	*	*	1320	1329	1395	1090	722		

* - No data.

Weekly Vehicle Counts

WeeklyVehicle-796
Site: 09-024d.0WE
Description: Boices Lane - Just East of Dalewood St
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) Dir(EW) Sp(5,100) Sep(>0)

	Mon 04 May	Tue 05 May	Wed 06 May	Thu 07 May	Fri 08 May	Sat 09 May	Sun 10 May	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	31	34	34	*	*	*	*	33.0	33.0
0100-0200	15	17	14	*	*	*	*	15.3	15.3
0200-0300	11	24	22	*	*	*	*	19.0	19.0
0300-0400	14	19	13	*	*	*	*	15.3	15.3
0400-0500	18	29	27	*	*	*	*	24.7	24.7
0500-0600	131	138	132	*	*	*	*	133.7	133.7
0600-0700	382	356	336	*	*	*	*	358.0	358.0
0700-0800	871<	874<	848<	*	*	*	*	864.3<	864.3<
0800-0900	790	765	768	*	*	*	*	774.3	774.3
0900-1000	611	680	667	*	*	*	*	652.7	652.7
1000-1100	717	641	731	*	*	*	*	696.3	696.3
1100-1200	812	787	812	*	*	*	*	803.7	803.7
1200-1300	925	1004	1035	*	*	*	*	988.0	988.0
1300-1400	951	895	909	*	*	*	*	918.3	918.3
1400-1500	950	937	*	*	*	*	*	943.5	943.5
1500-1600	1231	1166	*	*	*	*	*	1198.5	1198.5
1600-1700	1243<	1257<	*	*	*	*	*	1250.0<	1250.0<
1700-1800	1165	1170	*	*	*	*	*	1167.5	1167.5
1800-1900	809	715	*	*	*	*	*	762.0	762.0
1900-2000	598	539	*	*	*	*	*	568.5	568.5
2000-2100	400	394	*	*	*	*	*	397.0	397.0
2100-2200	246	224	*	*	*	*	*	235.0	235.0
2200-2300	134	160	*	*	*	*	*	147.0	147.0
2300-2400	103	72	*	*	*	*	*	87.5	87.5
Totals									
0700-1900	11075	10891	*	*	*	*	*	11019.2	11019.2
0600-2200	12701	12404	*	*	*	*	*	12577.7	12577.7
0600-0000	12938	12636	*	*	*	*	*	12812.2	12812.2
0000-0000	13158	12897	*	*	*	*	*	13053.2	13053.2
AM Peak	0700	0700	0700	*	*	*	*		
	871	874	848	*	*	*	*		
PM Peak	1600	1600	*	*	*	*	*		
	1243	1257	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-796 -- English (ENU)

Datasets:

Site:	**[09-024d] Boices Lane - Just East of Dalewood St**
Direction:	8 - East bound A>B, West bound B>A., **Lane:** 0
Survey Duration:	11:00 Tuesday, April 28, 2009 => 9:03 Thursday, May 07, 2009
File:	C:\Documents and Settings\dreynolds\Desktop\ATR Unload\09-024d07May2009BoicesLn.EC0 (Plus)
Identifier:	R519M98M MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class, Speed, Count)

Profile:

Filter time:	**13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	5 - 100 mph.
Direction:	[A-B] East (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (Scheme F2)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 57064 / 105075 (54.31%)

Weekly Vehicle Counts

WeeklyVehicle-796
Site: 09-024d.0WE
Description: Boices Lane - Just East of Dalewood St
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) DirAB(E) Sp(5,100) Sep(>0)

	Mon 27 Apr	Tue 28 Apr	Wed 29 Apr	Thu 30 Apr	Fri 01 May	Sat 02 May	Sun 03 May	Averages 1 - 5	1 - 7
Hour									
0000-0100	*	*	25	21	20	37	30	22.0	26.6
0100-0200	*	*	9	12	6	17	23	9.0	13.4
0200-0300	*	*	16	8	12	7	14	12.0	11.4
0300-0400	*	*	13	15	16	11	9	14.7	12.8
0400-0500	*	*	16	20	23	14	13	19.7	17.2
0500-0600	*	*	81	92	62	27	24	78.3	57.2
0600-0700	*	*	182	169	217	81	60	189.3	141.8
0700-0800	*	*	467	492	447	210	106	468.7	344.4
0800-0900	*	*	507	**553<**	515	390	173	**525.0<**	427.6
0900-1000	*	*	459	440	431	520	246	443.3	419.2
1000-1100	*	*	394	427	455	613	293	425.3	436.4
1100-1200	*	*	**513<**	476	**542<**	**686<**	**353<**	510.3	**514.0<**
1200-1300	*	*	561	595	634	587	400	596.7	555.4
1300-1400	*	471	527	492	624	**591<**	**449<**	528.5	525.7
1400-1500	*	517	527	466	592	493	379	525.5	495.7
1500-1600	*	728	712	710	**797<**	528	292	736.8	**627.8<**
1600-1700	*	714	706	**757<**	774	465	301	**737.8<**	619.5
1700-1800	*	622	**728<**	666	691	416	262	676.8	564.2
1800-1900	*	386	507	428	520	350	219	460.3	401.7
1900-2000	*	290	331	314	348	241	167	320.8	281.8
2000-2100	*	188	244	299	227	205	154	239.5	219.5
2100-2200	*	136	157	121	185	163	75	149.8	139.5
2200-2300	*	99	115	95	98	73	48	101.8	88.0
2300-2400	*	46	62	57	67	70	46	58.0	58.0
Totals									
0700-1900	*	*	6608	6502	7022	5849	3473	6634.8	5931.5
0600-2200	*	*	7522	7405	7999	6539	3929	7534.2	6714.1
0600-0000	*	*	7699	7557	8164	6682	4023	7693.9	6860.1
0000-0000	*	*	7859	7725	8303	6795	4136	7849.6	6998.7
AM Peak	*	*	1100	0800	1100	1100	1100		
	*	*	513	553	542	686	353		
PM Peak	*	*	1700	1600	1500	1300	1300		
	*	*	728	757	797	591	449		

* - No data.

Weekly Vehicle Counts

VeeklyVehicle-796
Site: 09-024d.0WE
Description: **Boices Lane - Just East of Dalewood St**
Filter time: **13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009**
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) DirAB(E) Sp(5,100) Sep(>0)

	Mon 04 May	Tue 05 May	Wed 06 May	Thu 07 May	Fri 08 May	Sat 09 May	Sun 10 May	Averages 1 - 5	1 - 7
Hour									
0000-0100	17	13	19	*	*	*	*	16.3	16.3
0100-0200	7	12	9	*	*	*	*	9.3	9.3
0200-0300	4	10	12	*	*	*	*	8.7	8.7
0300-0400	9	12	11	*	*	*	*	10.7	10.7
0400-0500	14	23	17	*	*	*	*	18.0	18.0
0500-0600	82	79	82	*	*	*	*	81.0	81.0
0600-0700	196	191	173	*	*	*	*	186.7	186.7
0700-0800	475	**475<**	454	*	*	*	*	468.0	468.0
0800-0900	**509<**	456	**486<**	*	*	*	*	**483.7<**	**483.7<**
0900-1000	376	439	417	*	*	*	*	410.7	410.7
1000-1100	445	368	426	*	*	*	*	413.0	413.0
1100-1200	496	459	459	*	*	*	*	471.3	471.3
1200-1300	517	546	607	*	*	*	*	556.7	556.7
1300-1400	507	471	484	*	*	*	*	487.3	487.3
1400-1500	490	496	*	*	*	*	*	493.0	493.0
1500-1600	**711<**	680	*	*	*	*	*	695.5	695.5
1600-1700	663	**732<**	*	*	*	*	*	**697.5<**	**697.5<**
1700-1800	628	615	*	*	*	*	*	621.5	621.5
1800-1900	415	366	*	*	*	*	*	390.5	390.5
1900-2000	309	253	*	*	*	*	*	281.0	281.0
2000-2100	172	185	*	*	*	*	*	178.5	178.5
2100-2200	116	96	*	*	*	*	*	106.0	106.0
2200-2300	73	73	*	*	*	*	*	73.0	73.0
2300-2400	65	47	*	*	*	*	*	56.0	56.0
Totals									
0700-1900	6232	6103	*	*	*	*	*	6188.7	6188.7
0600-2200	7025	6828	*	*	*	*	*	6940.8	6940.8
0600-0000	7163	6948	*	*	*	*	*	7069.8	7069.8
0000-0000	7296	7097	*	*	*	*	*	7213.8	7213.8
AM Peak	0800	0700	0800	*	*	*	*		
	509	475	486	*	*	*	*		
PM Peak	1500	1600	*	*	*	*	*		
	711	732	*	*	*	*	*		

* - No data.

MetroCount Traffic Executive
Weekly Vehicle Counts

WeeklyVehicle-796 -- English (ENU)

Datasets:

Site:	[09-024d] Boices Lane - Just East of Dalewood St
Direction:	8 - East bound A>B, West bound B>A., Lane: 0
Survey Duration:	11:00 Tuesday, April 28, 2009 => 9:03 Thursday, May 07, 2009
File:	C:\Documents and Settings\dreynolds\Desktop\ATR Unload\09-024d07May2009BoicesLn.EC0 (Plus)
Identifier:	R519M98M MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default
Data type:	Axle sensors - Paired (Class, Speed, Count)

Profile:

Filter time:	13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Included classes:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range:	5 - 100 mph.
Direction:	[B-A] West (bound)
Separation:	All - (Headway)
Name:	Factory default profile
Scheme:	Vehicle classification (Scheme F2)
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Vehicles = 45757 / 105075 (43.55%)

Weekly Vehicle Counts

VeeklyVehicle-796
Site: 09-024d.0WE
Description: Boices Lane - Just East of Dalewood St
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) DirBA(W) Sp(5,100) Sep(>0)

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
	27 Apr	28 Apr	29 Apr	30 Apr	01 May	02 May	03 May	1 - 5	1 - 7
Hour									
0000-0100	*	*	11	15	23	25	28	16.3	20.4
0100-0200	*	*	11	10	8	12	12	9.7	10.6
0200-0300	*	*	11	6	11	6	9	9.3	8.6
0300-0400	*	*	15	14	11	7	5	13.3	10.4
0400-0500	*	*	6	8	13	10	7	9.0	8.8
0500-0600	*	*	58	59	54	16	18	57.0	41.0
0600-0700	*	*	201	176	186	76	45	187.7	136.8
0700-0800	*	*	**374<**	**434<**	**410<**	172	49	**406.0<**	287.8
0800-0900	*	*	330	305	323	216	102	319.3	255.2
0900-1000	*	*	248	258	272	311	137	259.3	245.2
1000-1100	*	*	286	278	288	401	184	284.0	287.4
1100-1200	*	*	347	313	368	**469<**	**238<**	342.7	**347.0<**
1200-1300	*	*	398	441	446	449	295	428.3	405.8
1300-1400	*	383	392	437	459	**499<**	273	417.8	407.2
1400-1500	*	434	483	456	515	456	316	472.0	443.3
1500-1600	*	462	563	489	587	442	**320<**	525.3	477.2
1600-1700	*	546	**614<**	572	**621<**	351	303	**588.3<**	**501.2<**
1700-1800	*	500	573	**586<**	594	315	293	563.3	476.8
1800-1900	*	392	448	453	396	342	240	422.3	378.5
1900-2000	*	337	312	291	382	263	202	330.5	297.8
2000-2100	*	247	273	249	297	206	148	266.5	236.7
2100-2200	*	148	155	138	233	160	87	168.5	153.5
2200-2300	*	80	111	98	140	93	63	107.3	97.5
2300-2400	*	26	45	43	62	62	22	44.0	43.3
Totals									
0700-1900	*	*	5056	5022	5279	4423	2750	5028.4	4512.6
0600-2200	*	*	5997	5876	6377	5128	3232	5981.6	5337.4
0600-0000	*	*	6153	6017	6579	5283	3317	6132.8	5478.2
0000-0000	*	*	6265	6129	6699	5359	3396	6247.5	5578.0
AM Peak	*	*	0700	0700	0700	1100	1100		
	*	*	374	434	410	469	238		
PM Peak	*	*	1600	1700	1600	1300	1500		
	*	*	614	586	621	499	320		

* - No data.

Weekly Vehicle Counts

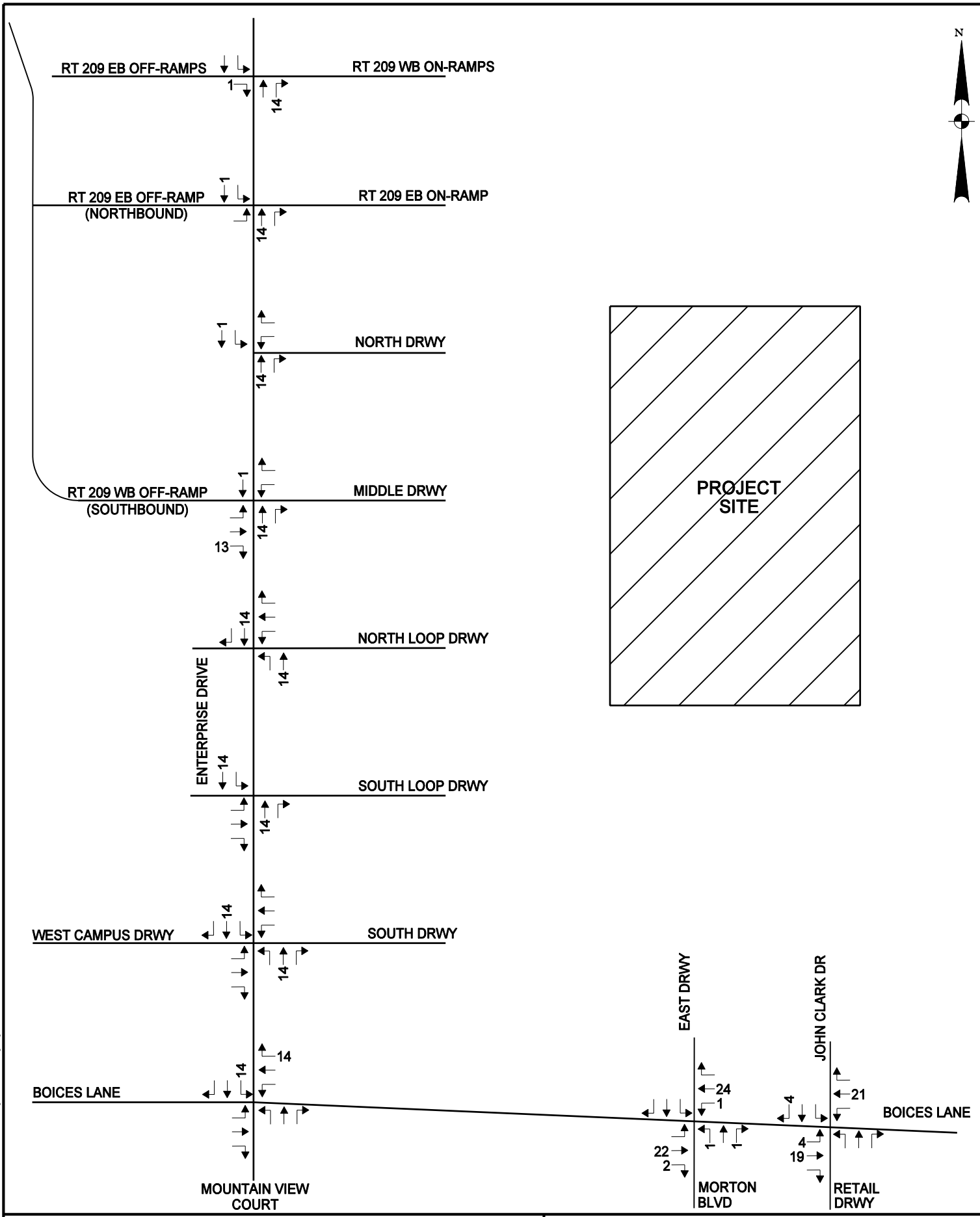
/eeklyVehicle-796
Site: 09-024d.0WE
Description: Boices Lane - Just East of Dalewood St
Filter time: 13:00 Tuesday, April 28, 2009 => 14:00 Wednesday, May 06, 2009
Scheme: Vehicle classification (Scheme F2)
Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12 13) DirBA(W) Sp(5,100) Sep(>0)

	Mon 04 May	Tue 05 May	Wed 06 May	Thu 07 May	Fri 08 May	Sat 09 May	Sun 10 May	Averages 1 - 5	Averages 1 - 7
Hour									
0000-0100	14	21	15	*	*	*	*	16.7	16.7
0100-0200	8	5	5	*	*	*	*	6.0	6.0
0200-0300	7	14	10	*	*	*	*	10.3	10.3
0300-0400	5	7	2	*	*	*	*	4.7	4.7
0400-0500	4	6	10	*	*	*	*	6.7	6.7
0500-0600	49	59	50	*	*	*	*	52.7	52.7
0600-0700	186	165	163	*	*	*	*	171.3	171.3
0700-0800	396<	399<	394<	*	*	*	*	396.3<	396.3<
0800-0900	281	309	282	*	*	*	*	290.7	290.7
0900-1000	235	241	250	*	*	*	*	242.0	242.0
1000-1100	272	273	305	*	*	*	*	283.3	283.3
1100-1200	316	328	353	*	*	*	*	332.3	332.3
1200-1300	408	458	428	*	*	*	*	431.3	431.3
1300-1400	444	424	425	*	*	*	*	431.0	431.0
1400-1500	460	441	*	*	*	*	*	450.5	450.5
1500-1600	520	486	*	*	*	*	*	503.0	503.0
1600-1700	580<	525	*	*	*	*	*	552.5<	552.5<
1700-1800	537	555<	*	*	*	*	*	546.0	546.0
1800-1900	394	349	*	*	*	*	*	371.5	371.5
1900-2000	289	286	*	*	*	*	*	287.5	287.5
2000-2100	228	209	*	*	*	*	*	218.5	218.5
2100-2200	130	128	*	*	*	*	*	129.0	129.0
2200-2300	61	87	*	*	*	*	*	74.0	74.0
2300-2400	38	25	*	*	*	*	*	31.5	31.5
Totals									
0700-1900	4843	4788	*	*	*	*	*	4830.5	4830.5
0600-2200	5676	5576	*	*	*	*	*	5636.8	5636.8
0600-0000	5775	5688	*	*	*	*	*	5742.3	5742.3
0000-0000	5862	5800	*	*	*	*	*	5839.3	5839.3
AM Peak	0700	0700	0700	*	*	*	*		
	396	399	394	*	*	*	*		
PM Peak	1600	1700	*	*	*	*	*		
	580	555	*	*	*	*	*		

* - No data.

Appendix D – Other Development Traffic Volumes

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York



OTHER DEVELOPMENT TRAFFIC VOLUMES PM PEAK HOUR

ULSTER TECH CITY GEIS
TOWN OF ULSTER,
ULSTER COUNTY, NEW YORK

CREIGHTON MANNING ENGINEERING, LLP

PROJECT: 09-024d	DATE: 9/09	FIGURE: D.1

ddoran
F:\Projects\2009\09-024d Ulster GEIS\cadd\dgn\traf_fig.dgn

Appendix E – Multi-Use Trip Credit

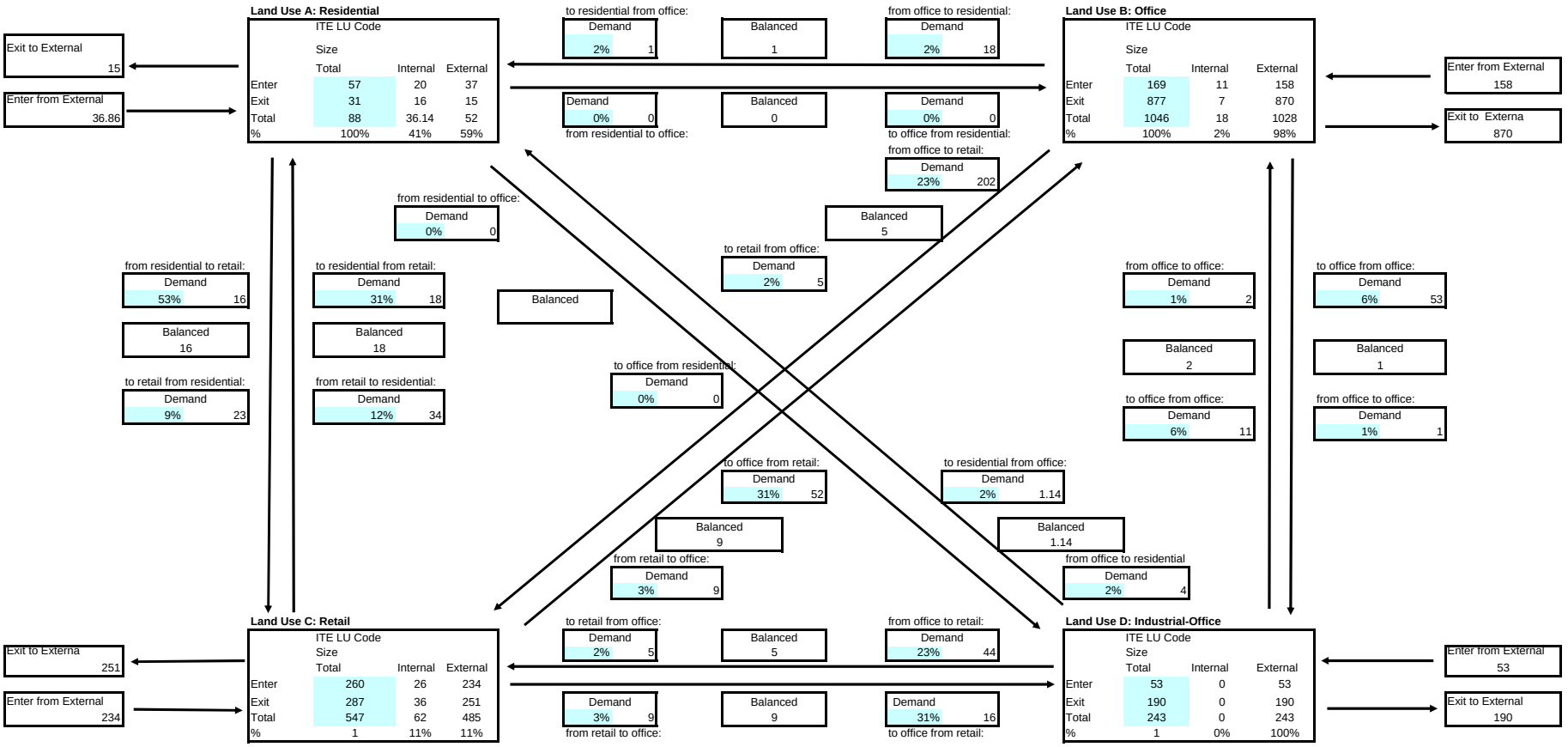
Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

MULTI-USE CREDIT WORKSHEET
Source: ITE Trip Generation Handbook

Time period: Mid-day, PM, or daily: PM

Project: Ulster Tech City
Calc by: MDN Date: 6/11/2009
Checked by: Date:

How to use this worksheet: 1) Save as this worksheet into your project directory and enter the header information of this sheet. 2) Calculate the total trip gen for each use and enter it in each land use box.
3) Enter the internal capture rates for the land uses based on the time period selected. The default is the PM peak hour. 4) internal caputure rate will automatically be calculated.



Net External Trips for Multi-Use Development					
	Land Use A	Land Use B	Land Use C	Land Use D	Total
Enter	36.86	158	234	53	481.86
Exit	15	870	251	190	1326
Total	51.86	1028	485	243	1807.86
Single-Use Trip Gen. Est.	88	1046	547	243	1924

Percent of Internal Capture
6.04

Appendix F – Level of Service Analysis

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

LOS Definitions

The following is an excerpt from the 2000 Highway Capacity Manual (HCM).

Level of Service for Signalized Intersections

Level of service for a signalized intersection is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions: in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-minute analysis period. Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group. Levels of service are defined to represent reasonable ranges in control delay.

LOS A describes operations with low control delay, up to 10 s/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay.

LOS B describes operations with control delay greater than 10 and up to 20 s/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

LOS C describes operations with control delay greater than 20 and up to 35 s/veh. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with control delay greater than 35 and up to 55 s/veh. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with control delay greater than 55 and up to 80 s/veh. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

LOS F describes operations with control delay in excess of 80 s/veh. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also be contribute significantly to high delay levels.

Level of Service Criteria for Unsignalized Intersections

Four measures are used to describe the performance of two-way stop controlled intersections: control delay, delay to major street through vehicles, queue length, and v/c ratio. The primary measure that is used to provide an estimate of LOS is control delay. This measure can be estimated for any movement on the minor (i.e., stop-controlled) street. By summing delay estimates for individual movements, a delay estimate for each minor street movement and minor street approach can be achieved. The level of service criteria is given in Exhibit 17-2/22.

For all-way stop controlled (AWSC) intersections, the average control delay (in seconds per vehicle) is used as the primary measure of performance. Control delay is the increased time of travel for a vehicle approaching and passing through an AWSC intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

Exhibit 17-2/22: Level-of-Service Criteria for Stop Controlled Intersections

Level of Service	Control Delay (sec/veh)
A	$\leq$ 10.0
B	>10.0 and $\leq$ 15.0
C	>15.0 and $\leq$ 25.0
D	>25.0 and $\leq$ 35.0
E	>35.0 and $\leq$ 50.0
F	>50.0

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MDN*
Agency/Co.	*CME, ENT199WBONexpm*
Date Performed	*6/18/2009*
Analysis Time Period	*PM Peak Hour*

Site Information

Intersection	*Enterprise Dr/Rt 199 WB On*
Jurisdiction	*Town of Ulster, NY*
Analysis Year	*2009 Existing*

Project Description *09-024d, Ulster Tech City*

East/West Street: *Route 199 WB On Ramp* | North/South Street: *Enterprise Drive*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*401*		*85*	*248*	
Peak-Hour Factor, PHF	*1.00*	*0.90*	*1.00*	*0.66*	*0.66*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*445*	*0*	*128*	*375*	*0*
Percent Heavy Vehicles	*0*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*		*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						
v (veh/h)		*128*						
C (m) (veh/h)		*1121*						
v/c		*0.11*						
95% queue length		*0.39*						
Control Delay (s/veh)		*8.6*						
LOS		*A*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

HCS+™ Version 5.3

Generated: 8/25/2009 10:52 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	12	12	12	12	12	14	12	12	12
Total Lost time (s)	4.0							4.0			4.0	
Lane Util. Factor	0.97							0.95			0.95	
Frt	1.00							1.00			1.00	
Flt Protected	0.95							1.00			0.99	
Satd. Flow (prot)	3735							3574			3557	
Flt Permitted	0.95							1.00			0.83	
Satd. Flow (perm)	3735							3574			2975	
Volume (vph)	103	0	0	0	0	0	0	699	0	36	265	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	123	0	0	0	0	0	0	863	0	40	294	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	123	0	0	0	0	0	0	863	0	0	334	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	2%	2%	1%	2%	0%	1%	2%
Turn Type	Prot									Perm		
Protected Phases	4							2			6	
Permitted Phases										6		
Actuated Green, G (s)	8.0							32.6			32.6	
Effective Green, g (s)	10.0							34.6			34.6	
Actuated g/C Ratio	0.19							0.66			0.66	
Clearance Time (s)	6.0							6.0			6.0	
Vehicle Extension (s)	3.0							3.0			3.0	
Lane Grp Cap (vph)	710							2351			1957	
v/s Ratio Prot	c0.03							c0.24				
v/s Ratio Perm											0.11	
v/c Ratio	0.17							0.37			0.17	
Uniform Delay, d1	17.8							4.1			3.5	
Progression Factor	1.00							1.00			1.00	
Incremental Delay, d2	0.1							0.1			0.0	
Delay (s)	18.0							4.2			3.5	
Level of Service	B							A			A	
Approach Delay (s)		18.0			0.0			4.2			3.5	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	9	839	2	3	262
Peak Hour Factor	0.50	0.50	0.75	0.75	0.90	0.90
Hourly flow rate (vph)	4	18	1119	3	3	291
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						721
pX, platoon unblocked						
vC, conflicting volume	1272	561			1121	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1272	561			1121	
tC, single (s)	6.8	7.3			4.8	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.5	
p0 queue free %	98	96			99	
cM capacity (veh/h)	161	424			467	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	18	746	376	3	146	146
Volume Left	4	0	0	0	3	0	0
Volume Right	0	18	0	3	0	0	0
cSH	161	424	1700	1700	467	1700	1700
Volume to Capacity	0.02	0.04	0.44	0.22	0.01	0.09	0.09
Queue Length 95th (ft)	2	3	0	0	1	0	0
Control Delay (s)	27.9	13.9	0.0	0.0	12.8	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	16.4		0.0		0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↕			↑↑↱			↑↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1	0	2	0	2	0	839	0	0	264	0
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	2	0	4	0	4	0	1119	0	0	293	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1281			1114	
pX, platoon unblocked												
vC, conflicting volume	857	1412	147	1266	1412	559	293			1119		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	857	1412	147	1266	1412	559	293			1119		
tC, single (s)	7.5	6.5	6.9	8.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	95	100	99	100			100		
cM capacity (veh/h)	249	139	874	83	139	477	1265			620		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	8	746	373	147	147
Volume Left	0	4	0	0	0	0
Volume Right	0	4	0	0	0	0
cSH	139	142	1700	1700	1700	1700
Volume to Capacity	0.01	0.06	0.44	0.22	0.09	0.09
Queue Length 95th (ft)	1	4	0	0	0	0
Control Delay (s)	31.2	31.9	0.0	0.0	0.0	0.0
Lane LOS	D	D				
Approach Delay (s)	31.2	31.9	0.0		0.0	
Approach LOS	D	D				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Volume (veh/h)	0	839	266	0	0	285
Peak Hour Factor	0.75	0.75	0.90	0.90	0.84	0.84
Hourly flow rate (vph)	0	1119	296	0	0	339
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)		1096	1299			
pX, platoon unblocked					0.96	
vC, conflicting volume	296				855	148
vC1, stage 1 conf vol					296	
vC2, stage 2 conf vol					559	
vCu, unblocked vol	296				803	148
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	61
cM capacity (veh/h)	1263				315	876

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1
Volume Total	559	559	148	148	339
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	339
cSH	1700	1700	1700	1700	876
Volume to Capacity	0.33	0.33	0.09	0.09	0.39
Queue Length 95th (ft)	0	0	0	0	46
Control Delay (s)	0.0	0.0	0.0	0.0	11.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.7
Approach LOS					B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	1	0	1	2	838	0	0	551	0
Peak Hour Factor	0.92	0.92	0.92	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2	0	2	3	1117	0	0	612	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788				
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	1178	1735	306	1429	1735	559	612			1117		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1119	1716	306	1388	1716	456	612			1054		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	100	100			100		
cM capacity (veh/h)	150	83	690	97	83	520	977			612		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	4	375	745	408	204
Volume Left	2	3	0	0	0
Volume Right	2	0	0	0	0
cSH	163	977	1700	1700	1700
Volume to Capacity	0.02	0.00	0.44	0.24	0.12
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	27.6	0.1	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	27.6	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	839	1	0	552	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1119	1	0	613	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501				
pX, platoon unblocked	0.90	0.90		0.90	0.90	0.90				0.90		
vC, conflicting volume	1173	1733	307	1426	1733	560	613			1120		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1084	1705	307	1364	1704	406	613			1026		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	157	82	695	96	82	537	962			619		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	746	374	204	409
Volume Left	2	0	0	0	0
Volume Right	0	0	1	0	0
cSH	157	1700	1700	619	1700
Volume to Capacity	0.01	0.44	0.22	0.00	0.24
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	28.2	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	28.2	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95		1.00	0.95	
Frt		1.00	0.85		0.93			1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1760	1776		1724			3569		1685	3444	
Flt Permitted		0.79	1.00		0.81			1.00		0.29	1.00	
Satd. Flow (perm)		1456	1776		1436			3569		521	3444	
Volume (vph)	38	1	23	19	0	21	0	781	9	4	535	13
Peak-hour factor, PHF	0.50	0.50	0.50	0.50	0.50	0.50	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	76	2	46	38	0	42	0	898	10	5	622	15
RTOR Reduction (vph)	0	0	38	0	35	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	78	8	0	45	0	0	907	0	5	635	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm						Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		7.7	7.7		7.7			35.5		35.5	35.5	
Effective Green, g (s)		9.7	9.7		9.7			37.5		37.5	37.5	
Actuated g/C Ratio		0.18	0.18		0.18			0.68		0.68	0.68	
Clearance Time (s)		6.0	6.0		6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		256	312		252			2425		354	2340	
v/s Ratio Prot								c0.25			0.18	
v/s Ratio Perm		c0.05	0.00		0.03					0.01		
v/c Ratio		0.30	0.03		0.18			0.37		0.01	0.27	
Uniform Delay, d1		19.8	18.8		19.4			3.8		2.9	3.5	
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.7	0.0		0.3			0.1		0.0	0.1	
Delay (s)		20.5	18.9		19.7			3.9		2.9	3.5	
Level of Service		C	B		B			A		A	A	
Approach Delay (s)		19.9			19.7			3.9			3.5	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	55.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1616	
Flt Permitted	0.43	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	743	1835			1845	1812		1935		1787	1616	
Volume (vph)	193	177	1	0	67	596	0	1	2	558	4	15
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	357	328	2	0	72	641	0	1	3	613	4	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	9	0
Lane Group Flow (vph)	357	330	0	0	72	641	0	1	0	613	11	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	20.2	20.2			4.3	66.9		0.5		28.2	28.2	
Effective Green, g (s)	22.2	22.2			6.3	66.9		2.5		30.2	30.2	
Actuated g/C Ratio	0.33	0.33			0.09	1.00		0.04		0.45	0.45	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	403	609			174	1812		72		807	729	
v/s Ratio Prot	c0.16	0.18			0.04			0.00		c0.34	0.01	
v/s Ratio Perm	c0.14					c0.35						
v/c Ratio	0.89	0.54			0.41	0.35		0.02		0.76	0.02	
Uniform Delay, d1	19.5	18.2			28.6	0.0		31.0		15.3	10.1	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	20.1	1.0			1.6	0.5		0.1		4.1	0.0	
Delay (s)	39.6	19.2			30.2	0.5		31.1		19.5	10.1	
Level of Service	D	B			C	A		C		B	B	
Approach Delay (s)		29.8			3.5			31.1			19.2	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	66.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693			1673	1561	1491	1837	
Flt Permitted		1.00	1.00	0.15	1.00			0.45	1.00	0.62	1.00	
Satd. Flow (perm)		1756	1492	253	1693			785	1561	966	1837	
Volume (vph)	0	402	311	168	299	0	294	2	207	6	4	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	0	502	389	189	336	0	320	2	225	12	8	0
RTOR Reduction (vph)	0	0	174	0	0	0	0	0	79	0	0	0
Lane Group Flow (vph)	0	502	215	189	336	0	0	322	146	12	8	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	17%	0%	0%
Turn Type	Perm		pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)		21.9	36.8	36.4	36.4			25.4	33.9	4.5	4.5	
Effective Green, g (s)		23.9	40.8	38.4	38.4			27.4	37.9	6.5	6.5	
Actuated g/C Ratio		0.32	0.55	0.52	0.52			0.37	0.51	0.09	0.09	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		569	906	327	881			495	886	85	162	
v/s Ratio Prot		c0.29	0.05	c0.08	0.20			c0.15	0.02		0.00	
v/s Ratio Perm			0.09	0.22				c0.09	0.07	0.01		
v/c Ratio		0.88	0.24	0.58	0.38			0.65	0.16	0.14	0.05	
Uniform Delay, d1		23.6	8.5	12.9	10.6			19.2	9.5	31.1	30.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		14.9	0.1	2.5	0.3			3.1	0.1	0.8	0.1	
Delay (s)		38.6	8.6	15.4	10.9			22.3	9.6	31.8	30.9	
Level of Service		D	A	B	B			C	A	C	C	
Approach Delay (s)		25.5			12.5			17.1			31.5	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3507			1816	1561		1827	1615		1772	1830
Flt Permitted		0.79			0.97	1.00		0.75	1.00		0.75	1.00
Satd. Flow (perm)		2817			1766	1561		1419	1615		1390	1830
Volume (vph)	141	440	34	11	281	15	24	6	10	23	6	162
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	158	494	38	13	331	18	40	10	17	26	7	182
RTOR Reduction (vph)	0	7	0	0	0	7	0	0	13	0	0	144
Lane Group Flow (vph)	0	683	0	0	344	11	0	50	4	0	33	38
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		24.0			24.0	24.0		6.9	6.9		6.9	6.9
Effective Green, g (s)		26.0			26.0	26.0		8.9	8.9		8.9	8.9
Actuated g/C Ratio		0.61			0.61	0.61		0.21	0.21		0.21	0.21
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1707			1070	946		294	335		288	380
v/s Ratio Prot												
v/s Ratio Perm		c0.24			0.19	0.01		c0.04	0.00		0.02	0.02
v/c Ratio		0.40			0.32	0.01		0.17	0.01		0.11	0.10
Uniform Delay, d1		4.4			4.1	3.4		14.0	13.5		13.8	13.8
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2			0.2	0.0		0.3	0.0		0.2	0.1
Delay (s)		4.5			4.3	3.4		14.2	13.5		14.0	13.9
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.5			4.3			14.1			13.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	42.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MDN	Intersection	Enterprise Dr/Rt 199 WB On
Agency/Co.	CME, ENT199WBONnbpm	Jurisdiction	Town of Ulster, NY
Date Performed	6/18/2009	Analysis Year	2014 No-Build
Analysis Time Period	PM Peak Hour		

Project Description: 09-024d, Ulster Tech City

East/West Street: Route 199 WB On Ramp | North/South Street: Enterprise Drive

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		421		89	261	
Peak-Hour Factor, PHF	1.00	0.90	1.00	0.66	0.66	1.00
Hourly Flow Rate, HFR (veh/h)	0	467	0	134	395	0
Percent Heavy Vehicles	0	--	--	1	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T		LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						
v (veh/h)		134						
C (m) (veh/h)		1100						
v/c		0.12						
95% queue length		0.41						
Control Delay (s/veh)		8.7						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

HCS+™ Version 5.3 Generated: 8/25/2009 10:53 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	12	12	12	12	12	14	12	12	12
Total Lost time (s)	4.0							4.0			4.0	
Lane Util. Factor	0.97							0.95			0.95	
Frt	1.00							1.00			1.00	
Flt Protected	0.95							1.00			0.99	
Satd. Flow (prot)	3735							3574			3557	
Flt Permitted	0.95							1.00			0.82	
Satd. Flow (perm)	3735							3574			2930	
Volume (vph)	108	0	0	0	0	0	0	749	0	39	279	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	129	0	0	0	0	0	0	925	0	43	310	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	129	0	0	0	0	0	0	925	0	0	353	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	2%	2%	1%	2%	0%	1%	2%
Turn Type	Prot									Perm		
Protected Phases	4							2			6	
Permitted Phases										6		
Actuated Green, G (s)	7.9							33.2			33.2	
Effective Green, g (s)	9.9							35.2			35.2	
Actuated g/C Ratio	0.19							0.66			0.66	
Clearance Time (s)	6.0							6.0			6.0	
Vehicle Extension (s)	3.0							3.0			3.0	
Lane Grp Cap (vph)	696							2369			1942	
v/s Ratio Prot	c0.03							c0.26				
v/s Ratio Perm											0.12	
v/c Ratio	0.19							0.39			0.18	
Uniform Delay, d1	18.2							4.1			3.4	
Progression Factor	1.00							1.00			1.00	
Incremental Delay, d2	0.1							0.1			0.0	
Delay (s)	18.3							4.2			3.5	
Level of Service	B							A			A	
Approach Delay (s)		18.3			0.0			4.2			3.5	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	53.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	9	896	2	3	276
Peak Hour Factor	0.50	0.50	0.75	0.75	0.90	0.90
Hourly flow rate (vph)	4	18	1195	3	3	307
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						721
pX, platoon unblocked						
vC, conflicting volume	1356	599			1197	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1356	599			1197	
tC, single (s)	6.8	7.3			4.8	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.5	
p0 queue free %	97	95			99	
cM capacity (veh/h)	142	399			432	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	18	796	401	3	153	153
Volume Left	4	0	0	0	3	0	0
Volume Right	0	18	0	3	0	0	0
cSH	142	399	1700	1700	432	1700	1700
Volume to Capacity	0.03	0.05	0.47	0.24	0.01	0.09	0.09
Queue Length 95th (ft)	2	4	0	0	1	0	0
Control Delay (s)	31.1	14.5	0.0	0.0	13.4	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	17.5		0.0		0.1		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↕			↑↑↑			↑↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1	0	2	0	2	0	896	0	0	278	0
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	2	0	4	0	4	0	1195	0	0	309	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1281			1114	
pX, platoon unblocked	1.00	1.00		1.00	1.00	1.00				1.00		
vC, conflicting volume	910	1504	154	1350	1504	597	309			1195		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	909	1503	154	1349	1503	596	309			1194		
tC, single (s)	7.5	6.5	6.9	8.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	100	94	100	99	100			100		
cM capacity (veh/h)	228	123	864	71	123	451	1248			580		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	8	796	398	154	154
Volume Left	0	4	0	0	0	0
Volume Right	0	4	0	0	0	0
cSH	123	122	1700	1700	1700	1700
Volume to Capacity	0.02	0.07	0.47	0.23	0.09	0.09
Queue Length 95th (ft)	1	5	0	0	0	0
Control Delay (s)	34.9	36.4	0.0	0.0	0.0	0.0
Lane LOS	D	E				
Approach Delay (s)	34.9	36.4	0.0		0.0	
Approach LOS	D	E				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Volume (veh/h)	0	896	280	0	0	313
Peak Hour Factor	0.75	0.75	0.90	0.90	0.84	0.84
Hourly flow rate (vph)	0	1195	311	0	0	373
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)		1096	1299			
pX, platoon unblocked					0.94	
vC, conflicting volume	311				908	156
vC1, stage 1 conf vol					311	
vC2, stage 2 conf vol					597	
vCu, unblocked vol	311				836	156
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	57
cM capacity (veh/h)	1246				302	866

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1
Volume Total	597	597	156	156	373
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	373
cSH	1700	1700	1700	1700	866
Volume to Capacity	0.35	0.35	0.09	0.09	0.43
Queue Length 95th (ft)	0	0	0	0	55
Control Delay (s)	0.0	0.0	0.0	0.0	12.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.3
Approach LOS					B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	1	0	1	2	895	0	0	593	0
Peak Hour Factor	0.92	0.92	0.92	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2	0	2	3	1193	0	0	659	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788				
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	1263	1858	329	1528	1858	597	659			1193		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1196	1845	329	1485	1845	470	659			1120		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	100	100			100		
cM capacity (veh/h)	129	68	666	81	68	500	939			568		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	4	400	796	439	220
Volume Left	2	3	0	0	0
Volume Right	2	0	0	0	0
cSH	139	939	1700	1700	1700
Volume to Capacity	0.03	0.00	0.47	0.26	0.13
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	31.7	0.1	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	31.7	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↑↑↱			↰↑↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	895	1	0	593	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1193	1	0	659	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501				
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	1256	1854	329	1523	1853	597	659			1195		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1165	1836	329	1465	1835	426	659			1096		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	135	67	672	80	67	514	925			574		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	796	399	220	439
Volume Left	2	0	0	0	0
Volume Right	0	0	1	0	0
cSH	135	1700	1700	574	1700
Volume to Capacity	0.01	0.47	0.23	0.00	0.26
Queue Length 95th (ft)	1	0	0	0	0
Control Delay (s)	32.0	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	32.0	0.0		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95		1.00	0.95	
Frt		1.00	0.85		0.93			1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1760	1776		1725			3569		1685	3444	
Flt Permitted		0.78	1.00		0.81			1.00		0.27	1.00	
Satd. Flow (perm)		1435	1776		1426			3569		483	3444	
Volume (vph)	40	1	24	20	0	22	0	835	9	4	576	14
Peak-hour factor, PHF	0.50	0.50	0.50	0.50	0.50	0.50	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	80	2	48	40	0	44	0	960	10	5	670	16
RTOR Reduction (vph)	0	0	40	0	36	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	82	8	0	48	0	0	969	0	5	684	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm						Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		7.6	7.6		7.6			36.6		36.6	36.6	
Effective Green, g (s)		9.6	9.6		9.6			38.6		38.6	38.6	
Actuated g/C Ratio		0.17	0.17		0.17			0.69		0.69	0.69	
Clearance Time (s)		6.0	6.0		6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		245	303		244			2451		332	2365	
v/s Ratio Prot								c0.27			0.20	
v/s Ratio Perm		c0.06	0.00		0.03					0.01		
v/c Ratio		0.33	0.03		0.19			0.40		0.02	0.29	
Uniform Delay, d1		20.5	19.4		20.0			3.8		2.8	3.4	
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.8	0.0		0.4			0.1		0.0	0.1	
Delay (s)		21.3	19.4		20.4			3.9		2.8	3.5	
Level of Service		C	B		C			A		A	A	
Approach Delay (s)		20.6			20.4			3.9			3.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1611	
Flt Permitted	0.43	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	741	1835			1845	1812		1935		1787	1611	
Volume (vph)	203	186	1	0	70	640	0	1	2	600	4	16
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	376	344	2	0	75	688	0	1	3	659	4	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	10	0
Lane Group Flow (vph)	376	346	0	0	75	688	0	1	0	659	12	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	20.2	20.2			4.3	68.1		0.5		29.4	29.4	
Effective Green, g (s)	22.2	22.2			6.3	68.1		2.5		31.4	31.4	
Actuated g/C Ratio	0.33	0.33			0.09	1.00		0.04		0.46	0.46	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	396	598			171	1812		71		824	743	
v/s Ratio Prot	c0.17	0.19			0.04			0.00		c0.37	0.01	
v/s Ratio Perm	c0.14					c0.38						
v/c Ratio	0.95	0.58			0.44	0.38		0.02		0.80	0.02	
Uniform Delay, d1	20.9	19.1			29.2	0.0		31.6		15.7	10.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	32.1	1.4			1.8	0.6		0.1		5.5	0.0	
Delay (s)	52.9	20.4			31.0	0.6		31.7		21.1	10.0	
Level of Service	D	C			C	A		C		C	A	
Approach Delay (s)		37.4			3.6			31.7			20.8	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693			1673	1561	1491	1837	
Flt Permitted		1.00	1.00	0.14	1.00			0.45	1.00	0.60	1.00	
Satd. Flow (perm)		1756	1492	235	1693			794	1561	937	1837	
Volume (vph)	0	445	329	177	338	0	310	2	219	6	4	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	0	556	411	199	380	0	337	2	238	12	8	0
RTOR Reduction (vph)	0	0	180	0	0	0	0	0	64	0	0	0
Lane Group Flow (vph)	0	556	231	199	380	0	0	339	174	12	8	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	17%	0%	0%
Turn Type	Perm		pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)		23.1	38.7	37.8	37.8			26.3	35.0	4.7	4.7	
Effective Green, g (s)		25.1	42.7	39.8	39.8			28.3	39.0	6.7	6.7	
Actuated g/C Ratio		0.33	0.56	0.52	0.52			0.37	0.51	0.09	0.09	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		579	916	318	885			499	882	82	162	
v/s Ratio Prot		c0.32	0.06	c0.09	0.22			c0.16	0.03		0.00	
v/s Ratio Perm			0.10	0.24				c0.10	0.08	0.01		
v/c Ratio		0.96	0.25	0.63	0.43			0.68	0.20	0.15	0.05	
Uniform Delay, d1		25.0	8.5	14.0	11.2			20.1	10.1	32.1	31.8	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		27.6	0.1	3.8	0.3			3.7	0.1	0.8	0.1	
Delay (s)		52.6	8.7	17.9	11.5			23.8	10.2	32.9	31.9	
Level of Service		D	A	B	B			C	B	C	C	
Approach Delay (s)		34.0			13.7			18.2			32.5	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	76.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3508			1816	1561		1826	1615		1771	1830
Flt Permitted		0.78			0.97	1.00		0.74	1.00		0.75	1.00
Satd. Flow (perm)		2762			1762	1561		1414	1615		1386	1830
Volume (vph)	153	481	36	12	316	16	25	6	11	24	6	174
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	172	540	40	14	372	19	42	10	18	27	7	196
RTOR Reduction (vph)	0	7	0	0	0	7	0	0	14	0	0	156
Lane Group Flow (vph)	0	745	0	0	386	12	0	52	4	0	34	40
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		25.4			25.4	25.4		7.1	7.1		7.1	7.1
Effective Green, g (s)		27.4			27.4	27.4		9.1	9.1		9.1	9.1
Actuated g/C Ratio		0.62			0.62	0.62		0.20	0.20		0.20	0.20
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1701			1085	961		289	330		283	374
v/s Ratio Prot												
v/s Ratio Perm		c0.27			0.22	0.01		c0.04	0.00		0.02	0.02
v/c Ratio		0.44			0.36	0.01		0.18	0.01		0.12	0.11
Uniform Delay, d1		4.5			4.2	3.3		14.6	14.1		14.4	14.4
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2			0.2	0.0		0.3	0.0		0.2	0.1
Delay (s)		4.7			4.4	3.3		14.9	14.1		14.6	14.5
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.7			4.4			14.7			14.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	44.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MDN	Intersection	Enterprise Dr/Rt 199 WB On
Agency/Co.	CME, ENT199WBONbupm	Jurisdiction	Town of Ulster, NY
Date Performed	6/18/2009	Analysis Year	2014 Build
Analysis Time Period	PM Peak Hour		

Project Description 09-024d, Ulster Tech City

East/West Street: Route 199 WB On Ramp | North/South Street: Enterprise Drive

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		612		89	327	
Peak-Hour Factor, PHF	1.00	0.90	1.00	0.66	0.66	1.00
Hourly Flow Rate, HFR (veh/h)	0	680	0	134	495	0
Percent Heavy Vehicles	0	--	--	1	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T		LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						
v (veh/h)		134						
C (m) (veh/h)		917						
v/c		0.15						
95% queue length		0.51						
Control Delay (s/veh)		9.6						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	12	12	12	12	12	14	12	12	12
Total Lost time (s)	4.0							4.0			4.0	
Lane Util. Factor	0.97							0.95			0.95	
Frt	1.00							1.00			1.00	
Flt Protected	0.95							1.00			1.00	
Satd. Flow (prot)	3735							3574			3562	
Flt Permitted	0.95							1.00			0.77	
Satd. Flow (perm)	3735							3574			2765	
Volume (vph)	108	0	0	0	0	0	0	1251	0	39	411	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	129	0	0	0	0	0	0	1544	0	43	457	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	129	0	0	0	0	0	0	1544	0	0	500	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	2%	2%	1%	2%	0%	1%	2%
Turn Type	Prot									Perm		
Protected Phases	4							2			6	
Permitted Phases										6		
Actuated Green, G (s)	7.6							46.3			46.3	
Effective Green, g (s)	9.6							48.3			48.3	
Actuated g/C Ratio	0.15							0.73			0.73	
Clearance Time (s)	6.0							6.0			6.0	
Vehicle Extension (s)	3.0							3.0			3.0	
Lane Grp Cap (vph)	544							2619			2027	
v/s Ratio Prot	c0.03							c0.43				
v/s Ratio Perm											0.18	
v/c Ratio	0.24							0.59			0.25	
Uniform Delay, d1	24.9							4.1			2.9	
Progression Factor	1.00							1.00			1.00	
Incremental Delay, d2	0.2							0.3			0.1	
Delay (s)	25.1							4.5			2.9	
Level of Service	C							A			A	
Approach Delay (s)		25.1			0.0			4.5			2.9	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	65	1587	18	0	334
Peak Hour Factor	0.80	0.80	0.75	0.75	0.90	0.90
Hourly flow rate (vph)	0	81	2116	24	0	371
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			393			721
pX, platoon unblocked	0.61	0.61			0.61	
vC, conflicting volume	2314	1070			2140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2517	466			2231	
tC, single (s)	6.8	6.9			4.8	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.5	
p0 queue free %	100	75			100	
cM capacity (veh/h)	14	331			89	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	81	1411	729	186	186
Volume Left	0	0	0	0	0
Volume Right	81	0	24	0	0
cSH	331	1700	1700	1700	1700
Volume to Capacity	0.25	0.83	0.43	0.11	0.11
Queue Length 95th (ft)	24	0	0	0	0
Control Delay (s)	19.4	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	19.4	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	14	123	366	39	0	391	0	1200	9	0	334	0
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	18	154	458	46	0	460	0	1600	12	0	371	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1281			1114	
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1631	1983	186	2326	1977	806	371			1612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1573	1980	186	2377	1973	617	371			1551		
tC, single (s)	7.5	6.5	6.9	8.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	45	0	100	0	100			100		
cM capacity (veh/h)	0	54	825	0	54	378	1184			366		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	171	458	506	1067	545	186	186
Volume Left	18	0	46	0	0	0	0
Volume Right	0	458	460	0	12	0	0
cSH	0	825	0	1700	1700	1700	1700
Volume to Capacity	Err	0.55	Err	0.63	0.32	0.11	0.11
Queue Length 95th (ft)	Err	87	Err	0	0	0	0
Control Delay (s)	Err	14.7	Err	0.0	0.0	0.0	0.0
Lane LOS	F	B	F				
Approach Delay (s)	Err		Err	0.0		0.0	
Approach LOS	F		F				

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	13	0	13	2	1196	0	0	739	0
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	16	0	16	3	1595	0	0	821	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788				
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1640	2421	411	2011	2421	797	821			1595		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1555	2520	411	2013	2520	514	821			1499		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	43	100	96	100			100		
cM capacity (veh/h)	59	22	590	29	22	413	817			359		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	534	1063	547	274
Volume Left	16	3	0	0	0
Volume Right	16	0	0	0	0
cSH	53	817	1700	1700	1700
Volume to Capacity	0.61	0.00	0.63	0.32	0.16
Queue Length 95th (ft)	61	0	0	0	0
Control Delay (s)	146.2	0.1	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	146.2	0.0		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	1197	5	5	747	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1596	7	6	830	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	1639	2444	415	2025	2440	801	830			1603		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1546	2558	415	2032	2554	492	830			1500		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	100	100			98		
cM capacity (veh/h)	62	20	592	26	20	415	798			360		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	1064	539	282	553
Volume Left	2	0	0	6	0
Volume Right	0	0	7	0	0
cSH	62	1700	1700	360	1700
Volume to Capacity	0.03	0.63	0.32	0.02	0.33
Queue Length 95th (ft)	2	0	0	1	0
Control Delay (s)	64.6	0.0	0.0	0.6	0.0
Lane LOS	F			A	
Approach Delay (s)	64.6	0.0		0.2	
Approach LOS	F				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95		1.00	0.95	
Frt		1.00	0.85		0.89			1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.99			1.00		0.95	1.00	
Satd. Flow (prot)		1752	1776		1671			3564		1685	3445	
Flt Permitted		0.45	1.00		0.94			1.00		0.20	1.00	
Satd. Flow (perm)		827	1776		1580			3564		355	3445	
Volume (vph)	40	0	24	52	0	270	0	892	18	101	632	14
Peak-hour factor, PHF	0.50	0.50	0.50	0.85	0.85	0.85	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	80	0	48	61	0	318	0	1025	21	117	735	16
RTOR Reduction (vph)	0	0	32	0	116	0	0	3	0	0	3	0
Lane Group Flow (vph)	0	80	16	0	263	0	0	1043	0	117	748	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm						Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		14.3	14.3		14.3			23.0		23.0	23.0	
Effective Green, g (s)		16.3	16.3		16.3			25.0		25.0	25.0	
Actuated g/C Ratio		0.33	0.33		0.33			0.51		0.51	0.51	
Clearance Time (s)		6.0	6.0		6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		273	587		522			1807		180	1747	
v/s Ratio Prot								0.29			0.22	
v/s Ratio Perm		0.10	0.01		c0.17					c0.33		
v/c Ratio		0.29	0.03		0.50			0.58		0.65	0.43	
Uniform Delay, d1		12.2	11.1		13.2			8.5		8.9	7.6	
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.6	0.0		0.8			0.5		8.1	0.2	
Delay (s)		12.8	11.2		14.0			8.9		17.1	7.8	
Level of Service		B	B		B			A		B	A	
Approach Delay (s)		12.2			14.0			8.9			9.1	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1611	
Flt Permitted	0.43	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	736	1835			1845	1812		1935		1787	1611	
Volume (vph)	203	186	1	0	70	706	0	1	2	688	4	16
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	376	344	2	0	75	759	0	1	3	756	4	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	9	0
Lane Group Flow (vph)	376	346	0	0	75	759	0	1	0	756	13	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	20.3	20.3			4.2	71.4		0.6		32.5	32.5	
Effective Green, g (s)	22.3	22.3			6.2	71.4		2.6		34.5	34.5	
Actuated g/C Ratio	0.31	0.31			0.09	1.00		0.04		0.48	0.48	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	380	573			160	1812		70		863	778	
v/s Ratio Prot	c0.17	0.19			0.04			0.00		c0.42	0.01	
v/s Ratio Perm	c0.14					c0.42						
v/c Ratio	0.99	0.60			0.47	0.42		0.02		0.88	0.02	
Uniform Delay, d1	22.9	20.8			31.0	0.0		33.2		16.5	9.6	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	42.9	1.8			2.2	0.7		0.1		9.9	0.0	
Delay (s)	65.8	22.6			33.2	0.7		33.3		26.4	9.6	
Level of Service	E	C			C	A		C		C	A	
Approach Delay (s)		45.1			3.6			33.3			26.0	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↑↔			↔			↔	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			1%	
Volume (veh/h)	24	832	10	10	678	36	6	0	6	102	0	26
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	26	914	11	11	729	39	7	0	7	120	0	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					984							
pX, platoon unblocked												
vC, conflicting volume	768			925			1389	1762	920	1749	1748	384
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	768			925			1389	1762	920	1749	1748	384
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			93	100	97	0	100	95
cM capacity (veh/h)	855			747			95	81	277	53	83	620

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	952	375	403	14	151
Volume Left	26	11	0	7	120
Volume Right	11	0	39	7	31
cSH	855	747	1700	142	65
Volume to Capacity	0.03	0.01	0.24	0.10	2.33
Queue Length 95th (ft)	2	1	0	8	365
Control Delay (s)	0.9	0.5	0.0	33.2	745.5
Lane LOS	A	A		D	F
Approach Delay (s)	0.9	0.2		33.2	745.5
Approach LOS				D	F

Intersection Summary			
Average Delay	60.0		
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693	1454		1682	1561	1491	1776	
Flt Permitted		1.00	1.00	0.13	1.00	1.00		0.28	1.00	0.54	1.00	
Satd. Flow (perm)		1756	1492	228	1693	1454		491	1561	840	1776	
Volume (vph)	0	580	360	177	381	72	317	34	219	199	92	26
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	0	725	450	199	428	81	345	37	238	398	184	52
RTOR Reduction (vph)	0	0	139	0	0	37	0	0	34	0	13	0
Lane Group Flow (vph)	0	725	311	199	428	44	0	382	204	398	223	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	17%	0%	0%
Turn Type	Perm		pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)		24.0	30.5	38.8	38.8	38.8		24.0	32.8	11.5	11.5	
Effective Green, g (s)		26.0	34.5	40.8	40.8	40.8		26.0	36.8	13.5	13.5	
Actuated g/C Ratio		0.35	0.46	0.55	0.55	0.55		0.35	0.49	0.18	0.18	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		610	768	326	923	793		306	851	152	321	
v/s Ratio Prot		c0.41	0.05	c0.09	0.25			c0.14	0.03		0.13	
v/s Ratio Perm			0.16	0.24		0.03		0.29	0.10	c0.47		
v/c Ratio		1.19	0.40	0.61	0.46	0.06		1.25	0.24	2.62	0.69	
Uniform Delay, d1		24.4	13.3	14.8	10.3	8.0		24.4	10.9	30.6	28.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		100.5	0.4	3.4	0.4	0.0		136.1	0.1	747.0	6.4	
Delay (s)		124.9	13.7	18.2	10.7	8.0		160.5	11.1	777.6	35.1	
Level of Service		F	B	B	B	A		F	B	F	D	
Approach Delay (s)		82.3			12.5			103.1			501.2	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM Average Control Delay	155.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↑↱			↰↑	↱		↰↑	↱		↰↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3526			1816	1561		1826	1615		1771	1830
Flt Permitted		0.75			0.96	1.00		0.74	1.00		0.74	1.00
Satd. Flow (perm)		2659			1753	1561		1413	1615		1359	1830
Volume (vph)	179	783	36	12	422	16	25	6	11	24	6	183
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	201	880	40	14	496	19	42	10	18	27	7	206
RTOR Reduction (vph)	0	3	0	0	0	6	0	0	15	0	0	172
Lane Group Flow (vph)	0	1118	0	0	510	13	0	52	3	0	34	34
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		34.0			34.0	34.0		6.6	6.6		6.6	6.6
Effective Green, g (s)		36.0			36.0	36.0		8.6	8.6		8.6	8.6
Actuated g/C Ratio		0.68			0.68	0.68		0.16	0.16		0.16	0.16
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1820			1200	1068		231	264		222	299
v/s Ratio Prot												
v/s Ratio Perm		c0.42			0.29	0.01		c0.04	0.00		0.03	0.02
v/c Ratio		0.61			0.42	0.01		0.23	0.01		0.15	0.11
Uniform Delay, d1		4.5			3.7	2.6		19.1	18.4		18.9	18.7
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6			0.2	0.0		0.5	0.0		0.3	0.2
Delay (s)		5.1			3.9	2.6		19.6	18.5		19.2	18.9
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		5.1			3.9			19.3			19.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	13	13	13	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95			0.95	
Frt		1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected		0.99	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		2138	1794	1243		1669		3570			3574	
Flt Permitted		0.99	1.00	0.62		1.00		1.00			1.00	
Satd. Flow (perm)		2138	1794	812		1669		3570			3574	
Volume (vph)	14	123	366	39	0	391	0	1200	9	0	334	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.85	0.85	0.85	0.75	0.75	0.75	0.90	0.90	0.90
Adj. Flow (vph)	18	154	458	46	0	460	0	1600	12	0	371	0
RTOR Reduction (vph)	0	0	307	0	0	16	0	0	0	0	0	0
Lane Group Flow (vph)	0	172	151	46	0	444	0	1612	0	0	371	0
Heavy Vehicles (%)	2%	0%	2%	50%	0%	0%	2%	1%	2%	2%	1%	2%
Turn Type	Perm		Prot	custom		custom						
Protected Phases		4	4			8		2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		22.4	22.4	22.4		22.4		38.4			38.4	
Effective Green, g (s)		23.4	23.4	23.4		23.4		39.4			39.4	
Actuated g/C Ratio		0.33	0.33	0.33		0.33		0.56			0.56	
Clearance Time (s)		5.0	5.0	5.0		5.0		5.0			5.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0			3.0	
Lane Grp Cap (vph)		707	593	268		552		1987			1989	
v/s Ratio Prot			0.08			c0.27		c0.45			0.10	
v/s Ratio Perm		0.08		0.06								
v/c Ratio		0.24	0.26	0.17		0.80		0.81			0.19	
Uniform Delay, d1		17.3	17.3	16.8		21.6		12.7			7.8	
Progression Factor		0.99	0.42	1.00		1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.2	0.3		8.3		2.6			0.0	
Delay (s)		17.3	7.5	17.1		29.9		15.3			7.8	
Level of Service		B	A	B		C		B			A	
Approach Delay (s)		10.1			28.8			15.3			7.8	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	13	0	13	2	1196	0	0	739	0
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	16	0	16	3	1595	0	0	821	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788			493	
pX, platoon unblocked	0.83	0.83	0.98	0.83	0.83	0.82	0.98			0.82		
vC, conflicting volume	1640	2421	411	2011	2421	797	821			1595		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1509	2454	386	1958	2454	532	803			1505		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	49	100	96	100			100		
cM capacity (veh/h)	66	25	603	32	25	408	817			361		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	32	3	797	797	547	274
Volume Left	16	3	0	0	0	0
Volume Right	16	0	0	0	0	0
cSH	60	817	1700	1700	1700	1700
Volume to Capacity	0.55	0.00	0.47	0.47	0.32	0.16
Queue Length 95th (ft)	55	0	0	0	0	0
Control Delay (s)	122.2	9.4	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	122.2	0.0			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	1197	5	5	747	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1596	7	6	830	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501			780	
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1639	2444	415	2025	2440	801	830			1603		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1557	2545	415	2031	2541	527	830			1512		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	100	100			98		
cM capacity (veh/h)	63	21	592	27	21	403	798			365		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	1064	539	6	415	415
Volume Left	2	0	0	6	0	0
Volume Right	0	0	7	0	0	0
cSH	63	1700	1700	365	1700	1700
Volume to Capacity	0.03	0.63	0.32	0.02	0.24	0.24
Queue Length 95th (ft)	2	0	0	1	0	0
Control Delay (s)	64.3	0.0	0.0	15.0	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	64.3	0.0		0.1		
Approach LOS	F					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1752	1776		1805	1615		3564		1685	3445	
Flt Permitted		0.72	1.00		0.70	1.00		1.00		0.20	1.00	
Satd. Flow (perm)		1323	1776		1339	1615		3564		363	3445	
Volume (vph)	40	0	24	52	0	270	0	892	18	101	632	14
Peak-hour factor, PHF	0.50	0.50	0.50	0.85	0.85	0.85	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	80	0	48	61	0	318	0	1025	21	117	735	16
RTOR Reduction (vph)	0	0	32	0	0	93	0	2	0	0	2	0
Lane Group Flow (vph)	0	80	16	0	61	225	0	1044	0	117	749	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm		Perm				Perm		
Protected Phases		3 4			7 8			6			6	
Permitted Phases	3 4		3 4	7 8		7 8				6		
Actuated Green, G (s)		22.7	22.7		22.7	22.7		39.3		39.3	39.3	
Effective Green, g (s)		24.7	24.7		24.7	24.7		41.3		41.3	41.3	
Actuated g/C Ratio		0.33	0.33		0.33	0.33		0.56		0.56	0.56	
Clearance Time (s)								6.0		6.0	6.0	
Vehicle Extension (s)								3.0		3.0	3.0	
Lane Grp Cap (vph)		442	593		447	539		1989		203	1923	
v/s Ratio Prot								0.29			0.22	
v/s Ratio Perm		0.06	0.01		0.05	c0.14				c0.32		
v/c Ratio		0.18	0.03		0.14	0.42		0.52		0.58	0.39	
Uniform Delay, d1		17.5	16.6		17.2	19.1		10.2		10.7	9.2	
Progression Factor		1.00	1.00		1.00	1.00		1.45		1.00	1.00	
Incremental Delay, d2		0.2	0.0		0.1	0.5		0.2		3.9	0.1	
Delay (s)		17.7	16.6		17.3	19.6		15.0		14.6	9.4	
Level of Service		B	B		B	B		B		B	A	
Approach Delay (s)		17.3			19.2			15.0			10.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1611	
Flt Permitted	0.51	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	875	1835			1845	1812		1935		1787	1611	
Volume (vph)	203	186	1	0	70	706	0	1	2	688	4	16
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	376	344	2	0	75	759	0	1	3	756	4	18
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	9	0
Lane Group Flow (vph)	376	346	0	0	75	759	0	1	0	756	13	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	22.7	15.2			8.4	74.0		0.3		33.0	33.0	
Effective Green, g (s)	24.7	17.2			10.4	74.0		2.3		35.0	35.0	
Actuated g/C Ratio	0.33	0.23			0.14	1.00		0.03		0.47	0.47	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	396	427			259	1812		60		845	762	
v/s Ratio Prot	c0.13	0.19			0.04			0.00		c0.42	0.01	
v/s Ratio Perm	c0.18					c0.42						
v/c Ratio	0.95	0.81			0.29	0.42		0.02		0.89	0.02	
Uniform Delay, d1	22.9	26.9			28.5	0.0		34.8		17.8	10.4	
Progression Factor	1.00	1.00			1.00	1.00		1.00		0.60	0.17	
Incremental Delay, d2	32.1	11.1			0.6	0.7		0.1		11.4	0.0	
Delay (s)	55.0	37.9			29.1	0.7		34.9		22.0	1.8	
Level of Service	D	D			C	A		C		C	A	
Approach Delay (s)		46.8			3.3			34.9			21.4	
Approach LOS		D			A			C			C	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	74.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			0.95			1.00			1.00	
Frt		1.00			0.99			0.93			0.97	
Flt Protected		1.00			1.00			0.98			0.96	
Satd. Flow (prot)		1939			3428			1729			1768	
Flt Permitted		0.97			0.94			0.88			0.76	
Satd. Flow (perm)		1887			3233			1558			1398	
Volume (vph)	24	832	10	10	676	38	6	0	6	102	0	26
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	914	11	11	727	41	7	0	7	120	0	31
RTOR Reduction (vph)	0	1	0	0	5	0	0	6	0	0	14	0
Lane Group Flow (vph)	0	950	0	0	774	0	0	8	0	0	137	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		42.1			42.1			9.8			9.8	
Effective Green, g (s)		43.1			43.1			10.8			10.8	
Actuated g/C Ratio		0.70			0.70			0.17			0.17	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1314			2251			272			244	
v/s Ratio Prot												
v/s Ratio Perm		c0.50			0.24			0.01			c0.10	
v/c Ratio		0.72			0.34			0.03			0.56	
Uniform Delay, d1		5.8			3.8			21.2			23.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.0			0.1			0.0			2.9	
Delay (s)		7.8			3.8			21.2			26.3	
Level of Service		A			A			C			C	
Approach Delay (s)		7.8			3.8			21.2			26.3	
Approach LOS		A			A			C			C	

Intersection Summary

HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	61.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰	↑	↱	↰	↑		↰	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	10	9	9	12	10	12	11	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3336	1492	1624	1693	1583	1668	1649		1770	1802	
Flt Permitted		1.00	1.00	0.18	1.00	1.00	0.39	1.00		0.65	1.00	
Satd. Flow (perm)		3336	1492	316	1693	1583	689	1649		1202	1802	
Volume (vph)	0	580	360	177	381	72	317	34	219	199	92	26
Peak-hour factor, PHF	0.92	0.80	0.80	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	725	450	199	428	78	345	37	238	216	100	28
RTOR Reduction (vph)	0	0	311	0	0	40	0	202	0	0	15	0
Lane Group Flow (vph)	0	725	139	199	428	38	345	73	0	216	113	0
Heavy Vehicles (%)	2%	1%	1%	0%	1%	2%	1%	2%	0%	2%	2%	2%
Turn Type			Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases		6		5	2		8	3		4	7	
Permitted Phases			6	2		2	3			7		
Actuated Green, G (s)		19.6	19.6	31.8	31.8	31.8	24.6	8.6		15.8	4.2	
Effective Green, g (s)		21.6	21.6	33.8	33.8	33.8	28.2	10.6		19.8	6.2	
Actuated g/C Ratio		0.31	0.31	0.48	0.48	0.48	0.40	0.15		0.28	0.09	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1029	460	306	817	764	529	250		450	160	
v/s Ratio Prot		0.22		c0.08	0.25		c0.17	0.04		0.09	0.06	
v/s Ratio Perm			0.09	c0.24		0.02	c0.10			0.04		
v/c Ratio		0.70	0.30	0.65	0.52	0.05	0.65	0.29		0.48	0.71	
Uniform Delay, d1		21.4	18.5	12.4	12.5	9.6	16.0	26.4		20.5	31.0	
Progression Factor		1.00	1.00	0.92	0.94	0.74	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.0	1.7	4.7	2.3	0.1	2.9	0.7		0.8	13.4	
Delay (s)		25.4	20.1	16.1	14.0	7.3	18.8	27.0		21.4	44.4	
Level of Service		C	C	B	B	A	B	C		C	D	
Approach Delay (s)		23.4			13.9			22.5			29.9	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↑↱			↰↑↑↱			↰↑	↱		↰↑	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.99			1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)		3526			3434			1826	1615		1771	1830
Flt Permitted		0.74			0.92			0.74	1.00		0.74	1.00
Satd. Flow (perm)		2637			3166			1413	1615		1371	1830
Volume (vph)	179	783	36	12	422	16	25	6	11	24	6	183
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	201	880	40	14	496	19	42	10	18	27	7	206
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	16	0	0	177
Lane Group Flow (vph)	0	1119	0	0	527	0	0	52	2	0	34	29
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm			Perm		Perm	Perm		Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4		4	8		8
Actuated Green, G (s)		50.3			50.3			7.7	7.7		7.7	7.7
Effective Green, g (s)		52.3			52.3			9.7	9.7		9.7	9.7
Actuated g/C Ratio		0.75			0.75			0.14	0.14		0.14	0.14
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1970			2365			196	224		190	254
v/s Ratio Prot												
v/s Ratio Perm		c0.42			0.17			c0.04	0.00		0.02	0.02
v/c Ratio		0.57			0.22			0.27	0.01		0.18	0.11
Uniform Delay, d1		3.9			2.7			27.0	26.0		26.6	26.4
Progression Factor		1.10			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3			0.2			0.7	0.0		0.5	0.2
Delay (s)		4.6			2.9			27.7	26.0		27.1	26.6
Level of Service		A			A			C	C		C	C
Approach Delay (s)		4.6			2.9			27.3			26.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	MDN
Agency/Co.	CME, ENT199WBONnb29pm
Date Performed	6/18/2009
Analysis Time Period	PM Peak Hour

Site Information

Intersection	Enterprise Dr/Rt 199 WB On
Jurisdiction	Town of Ulster, NY
Analysis Year	2029 No-Build

Project Description: 09-024d, Ulster Tech City

East/West Street: Route 199 WB On Ramp | North/South Street: Enterprise Drive

Intersection Orientation: North-South | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		489		104	303	
Peak-Hour Factor, PHF	1.00	0.90	1.00	0.66	0.66	1.00
Hourly Flow Rate, HFR (veh/h)	0	543	0	157	459	0
Percent Heavy Vehicles	0	--	--	1	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T		LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						
v (veh/h)		157						
C (m) (veh/h)		1031						
v/c		0.15						
95% queue length		0.54						
Control Delay (s/veh)		9.1						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

HCS+™ Version 5.3 Generated: 8/25/2009 10:53 AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	12	12	12	12	12	14	12	12	12
Total Lost time (s)	4.0							4.0			4.0	
Lane Util. Factor	0.97							0.95			0.95	
Frt	1.00							1.00			1.00	
Flt Protected	0.95							1.00			0.99	
Satd. Flow (prot)	3735							3574			3557	
Flt Permitted	0.95							1.00			0.80	
Satd. Flow (perm)	3735							3574			2852	
Volume (vph)	126	0	0	0	0	0	0	867	0	44	325	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	150	0	0	0	0	0	0	1070	0	49	361	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	150	0	0	0	0	0	0	1070	0	0	410	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	2%	2%	1%	2%	0%	1%	2%
Turn Type	Prot									Perm		
Protected Phases	4							2			6	
Permitted Phases										6		
Actuated Green, G (s)	7.0							28.6			28.6	
Effective Green, g (s)	9.0							30.6			30.6	
Actuated g/C Ratio	0.19							0.64			0.64	
Clearance Time (s)	6.0							6.0			6.0	
Vehicle Extension (s)	3.0							3.0			3.0	
Lane Grp Cap (vph)	706							2298			1833	
v/s Ratio Prot	c0.04							c0.30				
v/s Ratio Perm											0.14	
v/c Ratio	0.21							0.47			0.22	
Uniform Delay, d1	16.3							4.3			3.5	
Progression Factor	1.00							1.00			1.00	
Incremental Delay, d2	0.2							0.2			0.1	
Delay (s)	16.5							4.5			3.6	
Level of Service	B							A			A	
Approach Delay (s)		16.5			0.0			4.5			3.6	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	2	11	1038	2	4	321
Peak Hour Factor	0.50	0.50	0.75	0.75	0.90	0.90
Hourly flow rate (vph)	4	22	1384	3	4	357
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						721
pX, platoon unblocked						
vC, conflicting volume	1573	693			1387	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1573	693			1387	
tC, single (s)	6.8	7.3			4.8	
tC, 2 stage (s)						
tF (s)	3.5	3.5			2.5	
p0 queue free %	96	94			99	
cM capacity (veh/h)	102	343			356	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	4	22	923	464	4	178	178
Volume Left	4	0	0	0	4	0	0
Volume Right	0	22	0	3	0	0	0
cSH	102	343	1700	1700	356	1700	1700
Volume to Capacity	0.04	0.06	0.54	0.27	0.01	0.10	0.10
Queue Length 95th (ft)	3	5	0	0	1	0	0
Control Delay (s)	41.8	16.2	0.0	0.0	15.2	0.0	0.0
Lane LOS	E	C			C		
Approach Delay (s)	20.2		0.0		0.2		
Approach LOS	C						

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↕			↑↑↕			↑↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	1	0	2	0	2	0	1038	0	0	323	0
Peak Hour Factor	0.50	0.50	0.50	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	2	0	4	0	4	0	1384	0	0	359	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1281			1114	
pX, platoon unblocked	0.94	0.94		0.94	0.94	0.94				0.94		
vC, conflicting volume	1055	1743	179	1564	1743	692	359			1384		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	995	1727	179	1537	1727	609	359			1345		
tC, single (s)	7.5	6.5	6.9	8.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	100	91	100	99	100			100		
cM capacity (veh/h)	185	84	832	46	84	417	1196			478		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	8	923	461	179	179
Volume Left	0	4	0	0	0	0
Volume Right	0	4	0	0	0	0
cSH	84	83	1700	1700	1700	1700
Volume to Capacity	0.02	0.10	0.54	0.27	0.11	0.11
Queue Length 95th (ft)	2	8	0	0	0	0
Control Delay (s)	48.8	53.0	0.0	0.0	0.0	0.0
Lane LOS	E	F				
Approach Delay (s)	48.8	53.0	0.0		0.0	
Approach LOS	E	F				

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Yield	
Grade		0%	0%		0%	
Volume (veh/h)	0	1038	325	0	0	361
Peak Hour Factor	0.75	0.75	0.90	0.90	0.84	0.84
Hourly flow rate (vph)	0	1384	361	0	0	430
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					Raised	
Median storage veh)					0	
Upstream signal (ft)		1096	1299			
pX, platoon unblocked					0.89	
vC, conflicting volume	361				1053	181
vC1, stage 1 conf vol					361	
vC2, stage 2 conf vol					692	
vCu, unblocked vol	361				934	181
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	48
cM capacity (veh/h)	1194				271	834

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SE 1
Volume Total	692	692	181	181	430
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	430
cSH	1700	1700	1700	1700	834
Volume to Capacity	0.41	0.41	0.11	0.11	0.52
Queue Length 95th (ft)	0	0	0	0	75
Control Delay (s)	0.0	0.0	0.0	0.0	13.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.8
Approach LOS					B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	1	0	1	2	1037	0	0	686	0
Peak Hour Factor	0.92	0.92	0.92	0.50	0.50	0.50	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	2	0	2	3	1383	0	0	762	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1461	2150	381	1769	2150	691	762			1383		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1381	2173	381	1735	2173	497	762			1291		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	100	100			100		
cM capacity (veh/h)	89	40	617	50	40	456	859			464		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	4	464	922	508	254
Volume Left	2	3	0	0	0
Volume Right	2	0	0	0	0
cSH	90	859	1700	1700	1700
Volume to Capacity	0.04	0.00	0.54	0.30	0.15
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	46.9	0.1	0.0	0.0	0.0
Lane LOS	E	A			
Approach Delay (s)	46.9	0.0		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	1038	1	0	686	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1384	1	0	762	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1454	2148	381	1766	2147	693	762			1385		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1359	2173	381	1725	2172	466	762			1279		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			100		
cM capacity (veh/h)	93	39	623	49	39	463	846			468		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	923	463	254	508
Volume Left	2	0	0	0	0
Volume Right	0	0	1	0	0
cSH	93	1700	1700	468	1700
Volume to Capacity	0.02	0.54	0.27	0.00	0.30
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	44.6	0.0	0.0	0.0	0.0
Lane LOS	E				
Approach Delay (s)	44.6	0.0		0.0	
Approach LOS	E				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95		1.00	0.95	
Frt		1.00	0.85		0.93			1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1760	1776		1723			3568		1685	3445	
Flt Permitted		0.76	1.00		0.80			1.00		0.22	1.00	
Satd. Flow (perm)		1396	1776		1418			3568		395	3445	
Volume (vph)	46	1	28	23	0	26	0	967	11	5	667	15
Peak-hour factor, PHF	0.50	0.50	0.50	0.50	0.50	0.50	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	92	2	56	46	0	52	0	1111	13	6	776	17
RTOR Reduction (vph)	0	0	46	0	43	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	94	10	0	55	0	0	1123	0	6	791	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm						Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		7.2	7.2		7.2			34.7		34.7	34.7	
Effective Green, g (s)		9.2	9.2		9.2			36.7		36.7	36.7	
Actuated g/C Ratio		0.17	0.17		0.17			0.68		0.68	0.68	
Clearance Time (s)		6.0	6.0		6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		238	303		242			2429		269	2346	
v/s Ratio Prot								c0.31			0.23	
v/s Ratio Perm		c0.07	0.01		0.04					0.02		
v/c Ratio		0.39	0.03		0.23			0.46		0.02	0.34	
Uniform Delay, d1		19.9	18.6		19.3			4.0		2.8	3.6	
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		0.5			0.1		0.0	0.1	
Delay (s)		21.0	18.7		19.8			4.1		2.8	3.6	
Level of Service		C	B		B			A		A	A	
Approach Delay (s)		20.1			19.8			4.1			3.6	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM Average Control Delay	5.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1616	
Flt Permitted	0.47	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	804	1835			1845	1812		1935		1787	1616	
Volume (vph)	236	216	1	0	82	741	0	1	2	695	5	18
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	437	400	2	0	88	797	0	1	3	764	5	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	10	0
Lane Group Flow (vph)	437	402	0	0	88	797	0	1	0	764	15	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	21.9	21.9			6.2	75.1		0.6		34.6	34.6	
Effective Green, g (s)	23.9	23.9			8.2	75.1		2.6		36.6	36.6	
Actuated g/C Ratio	0.32	0.32			0.11	1.00		0.03		0.49	0.49	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	384	584			201	1812		67		871	788	
v/s Ratio Prot	c0.18	0.22			0.05			0.00		c0.43	0.01	
v/s Ratio Perm	c0.18					c0.44						
v/c Ratio	1.14	0.69			0.44	0.44		0.02		0.88	0.02	
Uniform Delay, d1	24.3	22.3			31.3	0.0		35.0		17.2	10.0	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	89.1	3.4			1.5	0.8		0.1		9.9	0.0	
Delay (s)	113.3	25.7			32.8	0.8		35.1		27.1	10.0	
Level of Service	F	C			C	A		D		C	A	
Approach Delay (s)		71.4			4.0			35.1			26.6	
Approach LOS		E			A			D			C	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	75.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0			4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00			1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693			1673	1561	1491	1837	
Flt Permitted		1.00	1.00	0.13	1.00			0.45	1.00	0.61	1.00	
Satd. Flow (perm)		1756	1492	228	1693			788	1561	951	1837	
Volume (vph)	0	513	380	206	389	0	360	2	254	7	5	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	0	641	475	231	437	0	391	2	276	14	10	0
RTOR Reduction (vph)	0	0	203	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	0	641	272	231	437	0	0	393	231	14	10	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	17%	0%	0%
Turn Type	Perm		pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)		24.0	41.0	39.0	39.0			27.6	36.6	4.6	4.6	
Effective Green, g (s)		26.0	45.0	41.0	41.0			29.6	40.6	6.6	6.6	
Actuated g/C Ratio		0.33	0.57	0.52	0.52			0.38	0.52	0.08	0.08	
Clearance Time (s)		6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		581	930	314	883			511	886	80	154	
v/s Ratio Prot		c0.37	0.07	c0.10	0.26			c0.19	0.04		0.01	
v/s Ratio Perm			0.11	0.28				c0.10	0.11	0.01		
v/c Ratio		1.10	0.29	0.74	0.49			0.77	0.26	0.17	0.06	
Uniform Delay, d1		26.3	8.6	16.3	12.1			21.5	10.6	33.5	33.2	
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2		68.8	0.2	8.7	0.4			6.9	0.2	1.0	0.2	
Delay (s)		95.1	8.8	24.9	12.6			28.4	10.8	34.5	33.3	
Level of Service		F	A	C	B			C	B	C	C	
Approach Delay (s)		58.4			16.8			21.1			34.0	
Approach LOS		E			B			C			C	

Intersection Summary			
HCM Average Control Delay	36.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	78.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3508			1816	1561		1827	1615		1768	1830
Flt Permitted		0.75			0.97	1.00		0.74	1.00		0.73	1.00
Satd. Flow (perm)		2656			1756	1561		1405	1615		1338	1830
Volume (vph)	176	556	42	13	364	18	29	7	12	31	7	202
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	198	625	47	15	428	21	48	12	20	35	8	227
RTOR Reduction (vph)	0	6	0	0	0	8	0	0	16	0	0	183
Lane Group Flow (vph)	0	864	0	0	443	13	0	60	4	0	43	44
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		26.4			26.4	26.4		6.8	6.8		6.8	6.8
Effective Green, g (s)		28.4			28.4	28.4		8.8	8.8		8.8	8.8
Actuated g/C Ratio		0.63			0.63	0.63		0.19	0.19		0.19	0.19
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1669			1103	981		274	314		260	356
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.25	0.01		c0.04	0.00		0.03	0.02
v/c Ratio		0.52			0.40	0.01		0.22	0.01		0.17	0.12
Uniform Delay, d1		4.6			4.2	3.1		15.3	14.7		15.1	15.0
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3			0.2	0.0		0.4	0.0		0.3	0.2
Delay (s)		4.9			4.4	3.2		15.7	14.7		15.4	15.2
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.9			4.4			15.5			15.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MDN*
Agency/Co.	*CME, ENT199WBONbu29pm*
Date Performed	*6/18/2009*
Analysis Time Period	*PM Peak Hour*

Site Information

Intersection	*Enterprise Dr/Rt 199 WB On*
Jurisdiction	*Town of Ulster, NY*
Analysis Year	*2029 Build*

Project Description *09-024d, Ulster Tech City*

East/West Street: *Route 199 WB On Ramp* | North/South Street: *Enterprise Drive*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*670*		*104*	*368*	
Peak-Hour Factor, PHF	*1.00*	*0.90*	*1.00*	*0.66*	*0.66*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*744*	*0*	*157*	*557*	*0*
Percent Heavy Vehicles	*0*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*		*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*						
v (veh/h)		*157*						
C (m) (veh/h)		*868*						
v/c		*0.18*						
95% queue length		*0.66*						
Control Delay (s/veh)		*10.1*						
LOS		*B*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	14	14	14	12	12	12	12	12	14	12	12	12
Total Lost time (s)	4.0							4.0			4.0	
Lane Util. Factor	0.97							0.95			0.95	
Frt	1.00							1.00			1.00	
Flt Protected	0.95							1.00			1.00	
Satd. Flow (prot)	3735							3574			3562	
Flt Permitted	0.95							1.00			0.75	
Satd. Flow (perm)	3735							3574			2679	
Volume (vph)	126	0	0	0	0	0	0	1361	0	44	456	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.81	0.81	0.81	0.90	0.90	0.90
Adj. Flow (vph)	150	0	0	0	0	0	0	1680	0	49	507	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	150	0	0	0	0	0	0	1680	0	0	556	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	2%	2%	1%	2%	0%	1%	2%
Turn Type	Prot									Perm		
Protected Phases	4							2			6	
Permitted Phases										6		
Actuated Green, G (s)	7.0							43.4			43.4	
Effective Green, g (s)	9.0							45.4			45.4	
Actuated g/C Ratio	0.14							0.73			0.73	
Clearance Time (s)	6.0							6.0			6.0	
Vehicle Extension (s)	3.0							3.0			3.0	
Lane Grp Cap (vph)	539							2600			1949	
v/s Ratio Prot	c0.04							c0.47				
v/s Ratio Perm											0.21	
v/c Ratio	0.28							0.65			0.29	
Uniform Delay, d1	23.8							4.4			2.9	
Progression Factor	1.00							1.00			1.00	
Incremental Delay, d2	0.3							0.6			0.1	
Delay (s)	24.1							4.9			3.0	
Level of Service	C							A			A	
Approach Delay (s)		24.1			0.0			4.9			3.0	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	5.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	65	1725	18	0	379
Peak Hour Factor	0.80	0.80	0.75	0.75	0.90	0.90
Hourly flow rate (vph)	0	81	2300	24	0	421
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			393			721
pX, platoon unblocked	0.52	0.52			0.52	
vC, conflicting volume	2523	1162			2324	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3002	393			2622	
tC, single (s)	6.8	6.9			4.8	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.5	
p0 queue free %	100	74			100	
cM capacity (veh/h)	6	318			51	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	81	1533	791	211	211
Volume Left	0	0	0	0	0
Volume Right	81	0	24	0	0
cSH	318	1700	1700	1700	1700
Volume to Capacity	0.26	0.90	0.47	0.12	0.12
Queue Length 95th (ft)	25	0	0	0	0
Control Delay (s)	20.2	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	20.2	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	14	123	413	39	0	391	0	1338	9	0	379	0
Peak Hour Factor	0.80	0.80	0.80	0.85	0.85	0.85	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	18	154	516	46	0	460	0	1784	12	0	421	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								1281			1114	
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1773	2217	211	2594	2211	898	421			1796		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1716	2272	211	2744	2265	619	421			1744		
tC, single (s)	7.5	6.5	6.9	8.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	4.0	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	35	0	100	0	100			100		
cM capacity (veh/h)	0	33	795	0	33	348	1134			284		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	171	516	506	1189	607	211	211
Volume Left	18	0	46	0	0	0	0
Volume Right	0	516	460	0	12	0	0
cSH	0	795	0	1700	1700	1700	1700
Volume to Capacity	Err	0.65	Err	0.70	0.36	0.12	0.12
Queue Length 95th (ft)	Err	122	Err	0	0	0	0
Control Delay (s)	Err	17.5	Err	0.0	0.0	0.0	0.0
Lane LOS	F	C	F				
Approach Delay (s)	Err		Err	0.0		0.0	
Approach LOS	F		F				

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	13	0	13	2	1334	0	0	831	0
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	16	0	16	3	1779	0	0	923	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788				
pX, platoon unblocked	0.77	0.77		0.77	0.77	0.77				0.77		
vC, conflicting volume	1834	2707	462	2246	2707	889	923			1779		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1784	2924	462	2321	2924	550	923			1711		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	0	100	96	100			100		
cM capacity (veh/h)	38	11	547	16	11	371	748			281		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	32	596	1186	616	308
Volume Left	16	3	0	0	0
Volume Right	16	0	0	0	0
cSH	30	748	1700	1700	1700
Volume to Capacity	1.08	0.00	0.70	0.36	0.18
Queue Length 95th (ft)	91	0	0	0	0
Control Delay (s)	382.4	0.1	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	382.4	0.0		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	1335	5	5	839	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1780	7	6	932	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501				
pX, platoon unblocked	0.76	0.76		0.76	0.76	0.76				0.76		
vC, conflicting volume	1833	2730	466	2261	2727	893	932			1787		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1781	2960	466	2343	2955	545	932			1720		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	100	100	100	100	100			98		
cM capacity (veh/h)	40	11	549	14	11	367	730			284		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	2	1187	600	316	621
Volume Left	2	0	0	6	0
Volume Right	0	0	7	0	0
cSH	40	1700	1700	284	1700
Volume to Capacity	0.05	0.70	0.35	0.02	0.37
Queue Length 95th (ft)	4	0	0	1	0
Control Delay (s)	100.5	0.0	0.0	0.7	0.0
Lane LOS	F			A	
Approach Delay (s)	100.5	0.0		0.2	
Approach LOS	F				

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0			4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95		1.00	0.95	
Frt		1.00	0.85		0.89			1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.99			1.00		0.95	1.00	
Satd. Flow (prot)		1752	1776		1671			3565		1685	3446	
Flt Permitted		0.41	1.00		0.93			1.00		0.16	1.00	
Satd. Flow (perm)		765	1776		1575			3565		287	3446	
Volume (vph)	46	0	28	52	0	270	0	1024	18	101	723	15
Peak-hour factor, PHF	0.50	0.50	0.50	0.85	0.85	0.85	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	92	0	56	61	0	318	0	1177	21	117	841	17
RTOR Reduction (vph)	0	0	39	0	91	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	92	17	0	288	0	0	1196	0	117	855	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm						Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8						6		
Actuated Green, G (s)		14.6	14.6		14.6			27.6		27.6	27.6	
Effective Green, g (s)		16.6	16.6		16.6			29.6		29.6	29.6	
Actuated g/C Ratio		0.31	0.31		0.31			0.55		0.55	0.55	
Clearance Time (s)		6.0	6.0		6.0			6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		234	544		482			1947		157	1882	
v/s Ratio Prot								0.34			0.25	
v/s Ratio Perm		0.12	0.01		c0.18					c0.41		
v/c Ratio		0.39	0.03		0.60			0.61		0.75	0.45	
Uniform Delay, d1		14.8	13.2		16.0			8.4		9.4	7.4	
Progression Factor		1.00	1.00		1.00			1.00		1.00	1.00	
Incremental Delay, d2		1.1	0.0		2.0			0.6		17.4	0.2	
Delay (s)		15.9	13.2		18.0			9.0		26.8	7.6	
Level of Service		B	B		B			A		C	A	
Approach Delay (s)		14.9			18.0			9.0			9.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1616	
Flt Permitted	0.47	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	808	1835			1845	1812		1935		1787	1616	
Volume (vph)	236	216	1	0	82	805	0	1	2	780	5	18
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	437	400	2	0	88	866	0	1	3	857	5	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	10	0
Lane Group Flow (vph)	437	402	0	0	88	866	0	1	0	857	15	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	22.0	22.0			6.3	79.2		0.7		38.5	38.5	
Effective Green, g (s)	24.0	24.0			8.3	79.2		2.7		40.5	40.5	
Actuated g/C Ratio	0.30	0.30			0.10	1.00		0.03		0.51	0.51	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	365	556			193	1812		66		914	826	
v/s Ratio Prot	c0.18	0.22			0.05			0.00		c0.48	0.01	
v/s Ratio Perm	c0.19					c0.48						
v/c Ratio	1.20	0.72			0.46	0.48		0.02		0.94	0.02	
Uniform Delay, d1	26.2	24.6			33.3	0.0		37.0		18.2	9.5	
Progression Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	112.4	4.6			1.7	0.9		0.1		16.5	0.0	
Delay (s)	138.6	29.3			35.0	0.9		37.1		34.7	9.6	
Level of Service	F	C			D	A		D		C	A	
Approach Delay (s)		86.2			4.1			37.1			34.0	
Approach LOS		F			A			D			C	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	79.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			1%	
Volume (veh/h)	24	948	10	10	777	36	6	0	6	102	0	26
Peak Hour Factor	0.91	0.91	0.91	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	26	1042	11	11	835	39	7	0	7	120	0	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					984							
pX, platoon unblocked												
vC, conflicting volume	874			1053			1570	1996	1047	1983	1982	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874			1053			1570	1996	1047	1983	1982	437
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			90	100	97	0	100	95
cM capacity (veh/h)	780			669			69	58	228	35	59	573

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1079	428	456	14	151
Volume Left	26	11	0	7	120
Volume Right	11	0	39	7	31
cSH	780	669	1700	106	43
Volume to Capacity	0.03	0.02	0.27	0.13	3.51
Queue Length 95th (ft)	3	1	0	11	Err
Control Delay (s)	1.1	0.5	0.0	43.9	Err
Lane LOS	A	A		E	F
Approach Delay (s)	1.1	0.2		43.9	Err
Approach LOS				E	F

Intersection Summary			
Average Delay	708.3		
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693	1454		1680	1561	1491	1776	
Flt Permitted		1.00	1.00	0.13	1.00	1.00		0.27	1.00	0.51	1.00	
Satd. Flow (perm)		1756	1492	228	1693	1454		470	1561	800	1776	
Volume (vph)	0	646	410	206	431	72	366	34	254	199	92	26
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.50	0.50	0.50
Adj. Flow (vph)	0	808	512	231	484	81	398	37	276	398	184	52
RTOR Reduction (vph)	0	0	122	0	0	37	0	0	24	0	13	0
Lane Group Flow (vph)	0	808	390	231	484	44	0	435	252	398	223	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	17%	0%	0%
Turn Type	Perm		pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)		24.0	30.9	39.0	39.0	39.0		24.0	33.0	11.1	11.1	
Effective Green, g (s)		26.0	34.9	41.0	41.0	41.0		26.0	37.0	13.1	13.1	
Actuated g/C Ratio		0.35	0.47	0.55	0.55	0.55		0.35	0.49	0.17	0.17	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		609	774	329	926	795		307	853	140	310	
v/s Ratio Prot		c0.46	0.06	c0.10	0.29			c0.17	0.04		0.13	
v/s Ratio Perm			0.20	0.28		0.03		0.32	0.12	c0.50		
v/c Ratio		1.33	0.50	0.70	0.52	0.06		1.42	0.30	2.84	0.72	
Uniform Delay, d1		24.5	14.0	31.8	10.8	7.9		24.5	11.3	30.9	29.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		158.2	0.5	6.6	0.5	0.0		205.8	0.2	848.7	7.7	
Delay (s)		182.7	14.5	38.5	11.3	8.0		230.3	11.5	879.6	37.0	
Level of Service		F	B	D	B	A		F	B	F	D	
Approach Delay (s)		117.5			18.9			145.3			565.9	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM Average Control Delay	182.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰↑↱			↰	↱		↰	↱		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3524			1817	1561		1827	1615		1771	1830
Flt Permitted		0.71			0.96	1.00		0.74	1.00		0.73	1.00
Satd. Flow (perm)		2514			1745	1561		1410	1615		1343	1830
Volume (vph)	202	855	42	13	469	18	29	7	12	28	7	211
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	227	961	47	15	552	21	48	12	20	31	8	237
RTOR Reduction (vph)	0	4	0	0	0	6	0	0	17	0	0	200
Lane Group Flow (vph)	0	1231	0	0	567	15	0	60	3	0	39	37
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		37.1			37.1	37.1		6.6	6.6		6.6	6.6
Effective Green, g (s)		39.1			39.1	39.1		8.6	8.6		8.6	8.6
Actuated g/C Ratio		0.70			0.70	0.70		0.15	0.15		0.15	0.15
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1765			1225	1096		218	249		207	283
v/s Ratio Prot												
v/s Ratio Perm		c0.49			0.32	0.01		c0.04	0.00		0.03	0.02
v/c Ratio		0.70			0.46	0.01		0.28	0.01		0.19	0.13
Uniform Delay, d1		4.8			3.7	2.5		20.8	20.0		20.5	20.3
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.2			0.3	0.0		0.7	0.0		0.4	0.2
Delay (s)		6.1			3.9	2.5		21.5	20.0		21.0	20.5
Level of Service		A			A	A		C	B		C	C
Approach Delay (s)		6.1			3.9			21.1			20.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	16	16	13	13	13	12	12	12	12	12	12
Total Lost time (s)		4.0	4.0	4.0		4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00	1.00		1.00		0.95			0.95	
Frt		1.00	0.85	1.00		0.85		1.00			1.00	
Flt Protected		0.99	1.00	0.95		1.00		1.00			1.00	
Satd. Flow (prot)		2138	1794	1243		1669		3570			3574	
Flt Permitted		0.99	1.00	0.61		1.00		1.00			1.00	
Satd. Flow (perm)		2138	1794	797		1669		3570			3574	
Volume (vph)	14	123	413	39	0	391	0	1338	9	0	379	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.85	0.85	0.85	0.75	0.75	0.75	0.90	0.90	0.90
Adj. Flow (vph)	18	154	516	46	0	460	0	1784	12	0	421	0
RTOR Reduction (vph)	0	0	276	0	0	9	0	0	0	0	0	0
Lane Group Flow (vph)	0	172	240	46	0	451	0	1796	0	0	421	0
Heavy Vehicles (%)	2%	0%	2%	50%	0%	0%	2%	1%	2%	2%	1%	2%
Turn Type	Perm		Prot	custom		custom						
Protected Phases		4	4			8		2			6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.4	24.4	24.4		24.4		43.4			43.4	
Effective Green, g (s)		25.4	25.4	25.4		25.4		44.4			44.4	
Actuated g/C Ratio		0.33	0.33	0.33		0.33		0.57			0.57	
Clearance Time (s)		5.0	5.0	5.0		5.0		5.0			5.0	
Vehicle Extension (s)		3.0	3.0	3.0		3.0		3.0			3.0	
Lane Grp Cap (vph)		698	586	260		545		2037			2040	
v/s Ratio Prot			0.13			c0.27		c0.50			0.12	
v/s Ratio Perm		0.08		0.06								
v/c Ratio		0.25	0.41	0.18		0.83		0.88			0.21	
Uniform Delay, d1		19.2	20.4	18.7		24.2		14.4			8.1	
Progression Factor		0.99	0.62	1.00		1.00		1.00			1.00	
Incremental Delay, d2		0.2	0.5	0.3		10.0		4.9			0.1	
Delay (s)		19.2	13.2	19.1		34.2		19.3			8.2	
Level of Service		B	B	B		C		B			A	
Approach Delay (s)		14.7			32.8			19.3			8.2	
Approach LOS		B			C			B			A	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	13	0	13	2	1334	0	0	831	0
Peak Hour Factor	0.92	0.92	0.92	0.80	0.80	0.80	0.75	0.75	0.75	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	16	0	16	3	1779	0	0	923	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								788			493	
pX, platoon unblocked	0.78	0.78	0.97	0.78	0.78	0.77	0.97			0.77		
vC, conflicting volume	1834	2707	462	2246	2707	889	923			1779		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1674	2788	414	2199	2788	555	890			1712		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	19	100	96	100			100		
cM capacity (veh/h)	47	14	570	20	14	369	747			282		

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	32	3	889	889	616	308
Volume Left	16	3	0	0	0	0
Volume Right	16	0	0	0	0	0
cSH	38	747	1700	1700	1700	1700
Volume to Capacity	0.86	0.00	0.52	0.52	0.36	0.18
Queue Length 95th (ft)	79	0	0	0	0	0
Control Delay (s)	262.3	9.8	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	262.3	0.0			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	0	0	0	0	0	0	1335	5	5	839	0
Peak Hour Factor	0.50	0.92	0.50	0.92	0.92	0.92	0.92	0.75	0.75	0.90	0.90	0.92
Hourly flow rate (vph)	2	0	0	0	0	0	0	1780	7	6	932	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								501			780	
pX, platoon unblocked	0.77	0.77		0.77	0.77	0.77				0.77		
vC, conflicting volume	1833	2730	466	2261	2727	893	932			1787		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1783	2948	466	2339	2944	562	932			1723		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	100	100	100	100	100	100			98		
cM capacity (veh/h)	40	11	549	15	11	362	730			286		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	2	1187	600	6	466	466
Volume Left	2	0	0	6	0	0
Volume Right	0	0	7	0	0	0
cSH	40	1700	1700	286	1700	1700
Volume to Capacity	0.05	0.70	0.35	0.02	0.27	0.27
Queue Length 95th (ft)	4	0	0	1	0	0
Control Delay (s)	99.7	0.0	0.0	17.8	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	99.7	0.0		0.1		
Approach LOS	F					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	12	15	12	12	12	12	12	12	10	11	11
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85		1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)		1752	1776		1805	1615		3565		1685	3446	
Flt Permitted		0.72	1.00		0.70	1.00		1.00		0.15	1.00	
Satd. Flow (perm)		1323	1776		1325	1615		3565		271	3446	
Volume (vph)	46	0	28	52	0	270	0	1024	18	101	723	15
Peak-hour factor, PHF	0.50	0.50	0.50	0.85	0.85	0.85	0.87	0.87	0.87	0.86	0.86	0.86
Adj. Flow (vph)	92	0	56	61	0	318	0	1177	21	117	841	17
RTOR Reduction (vph)	0	0	36	0	0	41	0	1	0	0	2	0
Lane Group Flow (vph)	0	92	20	0	61	277	0	1197	0	117	856	0
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type	Perm		Perm	Perm		Perm				Perm		
Protected Phases		3 4			7 8			6			6	
Permitted Phases	3 4		3 4	7 8		7 8				6		
Actuated Green, G (s)		31.3	31.3		31.3	31.3		50.2		50.2	50.2	
Effective Green, g (s)		33.3	33.3		33.3	33.3		52.2		52.2	52.2	
Actuated g/C Ratio		0.36	0.36		0.36	0.36		0.56		0.56	0.56	
Clearance Time (s)								6.0		6.0	6.0	
Vehicle Extension (s)								3.0		3.0	3.0	
Lane Grp Cap (vph)		471	633		472	575		1990		151	1924	
v/s Ratio Prot								0.34			0.25	
v/s Ratio Perm		0.07	0.01		0.05	c0.17				c0.43		
v/c Ratio		0.20	0.03		0.13	0.48		0.60		0.77	0.45	
Uniform Delay, d1		20.8	19.6		20.3	23.4		13.7		16.1	12.1	
Progression Factor		1.00	1.00		1.00	1.00		1.46		1.00	1.00	
Incremental Delay, d2		0.2	0.0		0.1	0.6		0.4		21.6	0.2	
Delay (s)		21.0	19.6		20.4	24.0		20.4		37.7	12.3	
Level of Service		C	B		C	C		C		D	B	
Approach Delay (s)		20.5			23.4			20.4			15.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	11	11	12	12	16	16	16	16	12	11	11
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00			1.00	0.85		0.90		1.00	0.88	
Flt Protected	0.95	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1624	1835			1845	1812		1935		1787	1616	
Flt Permitted	0.43	1.00			1.00	1.00		1.00		0.95	1.00	
Satd. Flow (perm)	728	1835			1845	1812		1935		1787	1616	
Volume (vph)	236	216	1	0	82	805	0	1	2	780	5	18
Peak-hour factor, PHF	0.54	0.54	0.54	0.93	0.93	0.93	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	437	400	2	0	88	866	0	1	3	857	5	20
RTOR Reduction (vph)	0	0	0	0	0	0	0	3	0	0	10	0
Lane Group Flow (vph)	437	402	0	0	88	866	0	1	0	857	15	0
Heavy Vehicles (%)	0%	0%	0%	0%	3%	1%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt			pm+pt		Free	Split			Split		
Protected Phases	7	4		3	8		2	2		1	1	
Permitted Phases	4			8		Free						
Actuated Green, G (s)	31.3	22.9			5.3	93.5		0.4		43.8	43.8	
Effective Green, g (s)	33.3	24.9			7.3	93.5		2.4		45.8	45.8	
Actuated g/C Ratio	0.36	0.27			0.08	1.00		0.03		0.49	0.49	
Clearance Time (s)	6.0	6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	470	489			144	1812		50		875	792	
v/s Ratio Prot	c0.22	0.22			0.05			0.00		c0.48	0.01	
v/s Ratio Perm	c0.11					c0.48						
v/c Ratio	0.93	0.82			0.61	0.48		0.02		0.98	0.02	
Uniform Delay, d1	26.7	32.2			41.7	0.0		44.4		23.4	12.3	
Progression Factor	1.00	1.00			1.00	1.00		1.00		0.52	0.13	
Incremental Delay, d2	24.8	10.7			7.5	0.9		0.2		24.0	0.0	
Delay (s)	51.5	42.9			49.2	0.9		44.6		36.2	1.6	
Level of Service	D	D			D	A		D		D	A	
Approach Delay (s)		47.4			5.4			44.6			35.2	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	13	13	12	12	11	11	12	12	12	12	12	12
Grade (%)		0%			0%			0%			1%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			0.95			1.00			1.00	
Frt		1.00			0.99			0.93			0.97	
Flt Protected		1.00			1.00			0.98			0.96	
Satd. Flow (prot)		1940			3432			1729			1765	
Flt Permitted		0.97			0.94			0.89			0.77	
Satd. Flow (perm)		1885			3234			1573			1403	
Volume (vph)	24	948	10	10	777	36	6	0	6	102	0	30
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	26	1042	11	11	835	39	7	0	7	120	0	35
RTOR Reduction (vph)	0	1	0	0	4	0	0	6	0	0	16	0
Lane Group Flow (vph)	0	1078	0	0	881	0	0	8	0	0	139	0
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		47.6			47.6			10.1			10.1	
Effective Green, g (s)		48.6			48.6			11.1			11.1	
Actuated g/C Ratio		0.72			0.72			0.16			0.16	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1353			2322			258			230	
v/s Ratio Prot												
v/s Ratio Perm		c0.57			0.27			0.01			c0.10	
v/c Ratio		0.80			0.38			0.03			0.60	
Uniform Delay, d1		6.3			3.7			23.8			26.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		3.4			0.1			0.1			4.4	
Delay (s)		9.7			3.8			23.8			30.7	
Level of Service		A			A			C			C	
Approach Delay (s)		9.7			3.8			23.8			30.7	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	10	9	9	12	10	12	11	12	12	12
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3336	1492	1624	1693	1583	1668	1645		1770	1802	
Flt Permitted		1.00	1.00	0.16	1.00	1.00	0.40	1.00		0.67	1.00	
Satd. Flow (perm)		3336	1492	270	1693	1583	702	1645		1242	1802	
Volume (vph)	0	646	410	206	431	72	366	34	254	199	92	26
Peak-hour factor, PHF	0.92	0.80	0.80	0.89	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	808	512	231	484	78	398	37	276	216	100	28
RTOR Reduction (vph)	0	0	356	0	0	40	0	234	0	0	15	0
Lane Group Flow (vph)	0	808	156	231	484	38	398	79	0	216	113	0
Heavy Vehicles (%)	2%	1%	1%	0%	1%	2%	1%	2%	0%	2%	2%	2%
Turn Type			Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases		6		5	2		8	3		4	7	
Permitted Phases			6	2		2	3			7		
Actuated Green, G (s)		19.3	19.3	31.8	31.8	31.8	24.8	8.6		15.6	4.0	
Effective Green, g (s)		21.3	21.3	33.8	33.8	33.8	28.2	10.6		19.6	6.0	
Actuated g/C Ratio		0.30	0.30	0.48	0.48	0.48	0.40	0.15		0.28	0.09	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1015	454	295	817	764	534	249		450	154	
v/s Ratio Prot		0.24		c0.10	0.29		c0.19	0.05		0.09	0.06	
v/s Ratio Perm			0.10	c0.28		0.02	c0.11			0.04		
v/c Ratio		0.80	0.34	0.78	0.59	0.05	0.75	0.32		0.48	0.74	
Uniform Delay, d1		22.4	18.9	13.4	13.1	9.6	16.6	26.5		20.8	31.2	
Progression Factor		1.00	1.00	1.72	1.21	2.13	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.5	2.1	12.3	3.0	0.1	5.6	0.7		0.8	16.6	
Delay (s)		28.8	21.0	35.4	18.9	20.5	22.2	27.2		21.6	47.9	
Level of Service		C	C	D	B	C	C	C		C	D	
Approach Delay (s)		25.8			23.9			24.4			31.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			0.95			1.00	1.00		1.00	1.00
Frt		0.99			0.99			1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)		3524			3434			1827	1615		1771	1830
Flt Permitted		0.68			0.91			0.74	1.00		0.73	1.00
Satd. Flow (perm)		2416			3143			1410	1615		1343	1830
Volume (vph)	202	855	42	13	469	18	29	7	12	28	7	211
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	227	961	47	15	552	21	48	12	20	31	8	237
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	18	0	0	177
Lane Group Flow (vph)	0	1233	0	0	585	0	0	60	2	0	39	60
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm			Perm		Perm	Perm		pm+ov
Protected Phases	5	2			6			4			8	5
Permitted Phases	2			6			4		4	8		8
Actuated Green, G (s)		52.4			40.8			5.6	5.6		5.6	11.2
Effective Green, g (s)		54.4			42.8			7.6	7.6		7.6	15.2
Actuated g/C Ratio		0.78			0.61			0.11	0.11		0.11	0.22
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1998			1922			153	175		146	502
v/s Ratio Prot		c0.07										0.01
v/s Ratio Perm		c0.41			0.19			c0.04	0.00		0.03	0.02
v/c Ratio		0.62			0.30			0.39	0.01		0.27	0.12
Uniform Delay, d1		3.3			6.5			29.0	27.9		28.6	22.0
Progression Factor		1.14			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4			0.4			1.7	0.0		1.0	0.1
Delay (s)		4.2			6.9			30.7	27.9		29.6	22.1
Level of Service		A			A			C	C		C	C
Approach Delay (s)		4.2			6.9			30.0			23.2	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Appendix G – Peak Hour Traffic Signal Warrants

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

Figure 4C-4
Reduced Peak Hour Volume Warrant
Source: Federal MUTCD

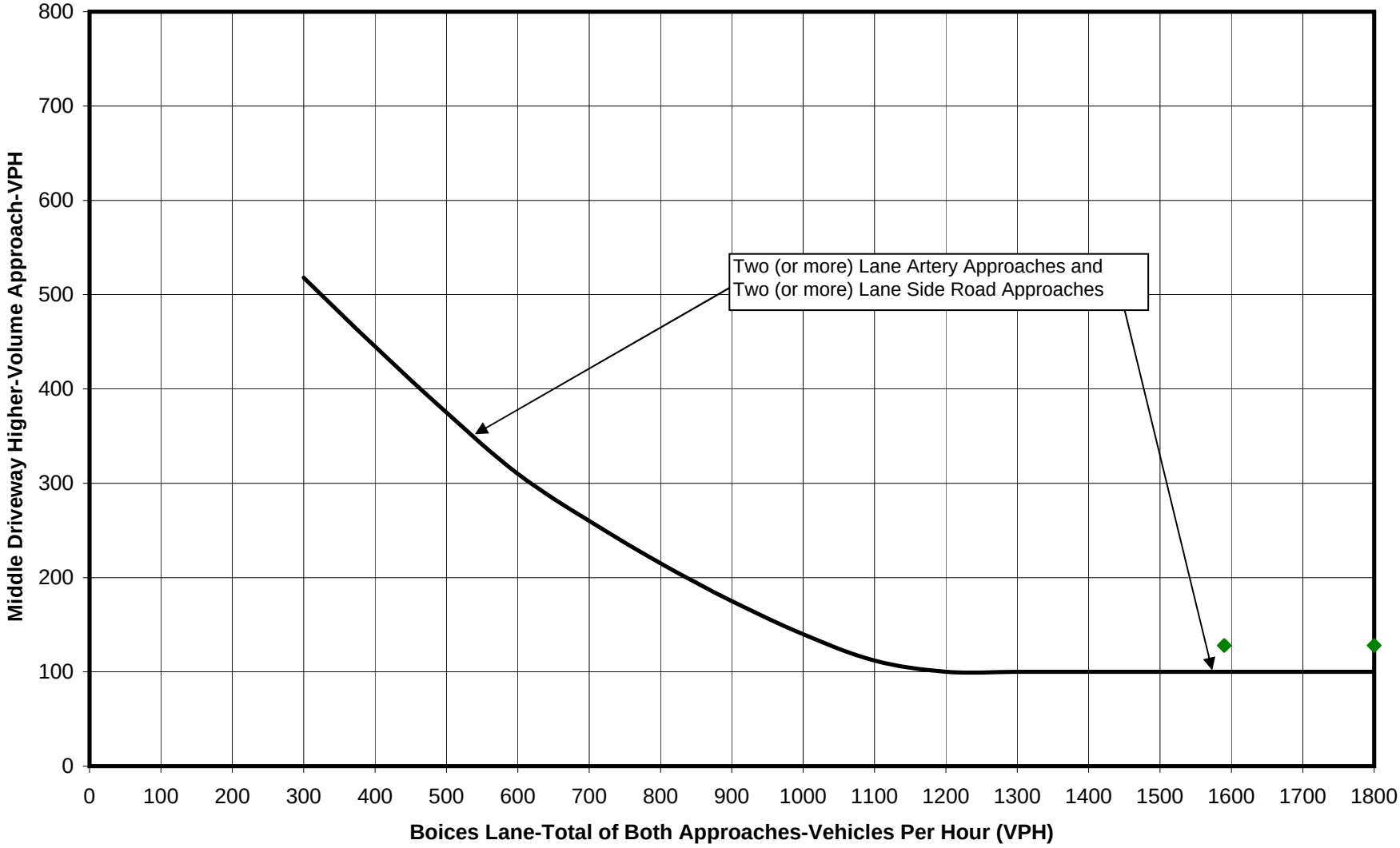
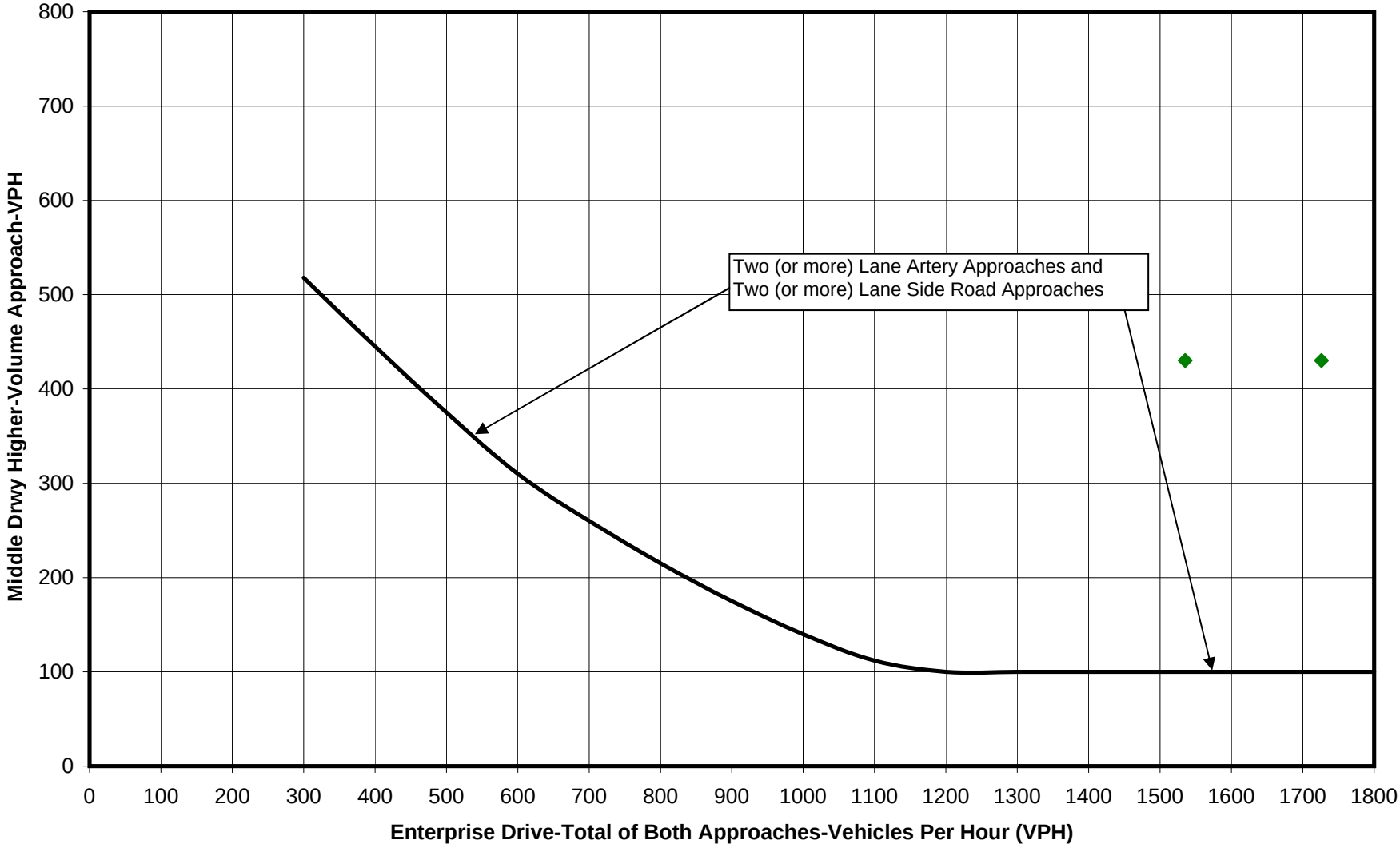


Figure 4C-4
Reduced Peak Hour Volume Warrant
Source: Federal MUTCD



Appendix H – Threshold Level of Service Analysis

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.98	
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693	1454		1675	1561	1728	1777	
Flt Permitted		1.00	1.00	0.13	1.00	1.00		0.50	1.00	0.55	1.00	
Satd. Flow (perm)		1756	1492	228	1693	1454		873	1561	1007	1777	
Volume (vph)	0	465	335	177	343	18	308	9	219	50	19	3
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	581	419	199	385	20	335	10	238	59	22	4
RTOR Reduction (vph)	0	0	197	0	0	9	0	0	59	0	4	0
Lane Group Flow (vph)	0	581	222	199	385	11	0	345	179	59	22	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	1%	1%	1%
Turn Type			pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases			6	2		2	8		8	4		
Actuated Green, G (s)		24.0	36.4	38.8	38.8	38.8		25.6	34.4	7.2	7.2	
Effective Green, g (s)		26.0	40.4	40.8	40.8	40.8		27.6	38.4	9.2	9.2	
Actuated g/C Ratio		0.34	0.53	0.53	0.53	0.53		0.36	0.50	0.12	0.12	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		598	867	319	904	776		467	866	121	214	
v/s Ratio Prot		c0.33	0.05	c0.09	0.23			c0.14	0.03		0.01	
v/s Ratio Perm			0.10	0.24		0.01		c0.13	0.09	0.06		
v/c Ratio		0.97	0.26	0.62	0.43	0.01		0.74	0.21	0.49	0.11	
Uniform Delay, d1		24.8	9.8	14.0	10.7	8.4		21.3	10.5	31.4	29.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		29.6	0.2	3.8	0.3	0.0		6.0	0.1	3.1	0.2	
Delay (s)		54.4	10.0	17.8	11.1	8.4		27.3	10.7	34.5	30.1	
Level of Service		D	A	B	B	A		C	B	C	C	
Approach Delay (s)		35.8			13.2			20.5			33.1	
Approach LOS		D			B			C			C	

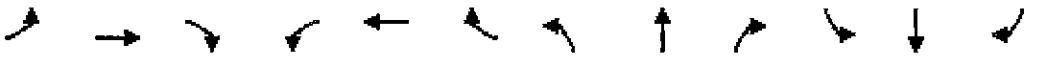
Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	76.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3512			1816	1561		1826	1615		1771	1830
Flt Permitted		0.77			0.97	1.00		0.74	1.00		0.75	1.00
Satd. Flow (perm)		2751			1761	1561		1413	1615		1382	1830
Volume (vph)	160	538	36	12	337	16	25	6	11	24	6	176
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	180	604	40	14	396	19	42	10	18	27	7	198
RTOR Reduction (vph)	0	6	0	0	0	7	0	0	14	0	0	159
Lane Group Flow (vph)	0	818	0	0	410	12	0	52	4	0	34	39
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		26.5			26.5	26.5		7.0	7.0		7.0	7.0
Effective Green, g (s)		28.5			28.5	28.5		9.0	9.0		9.0	9.0
Actuated g/C Ratio		0.63			0.63	0.63		0.20	0.20		0.20	0.20
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1723			1103	978		279	319		273	362
v/s Ratio Prot												
v/s Ratio Perm		c0.30			0.23	0.01		c0.04	0.00		0.02	0.02
v/c Ratio		0.47			0.37	0.01		0.19	0.01		0.12	0.11
Uniform Delay, d1		4.5			4.1	3.2		15.2	14.7		15.0	15.0
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2			0.2	0.0		0.3	0.0		0.2	0.1
Delay (s)		4.7			4.4	3.2		15.5	14.7		15.2	15.1
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.7			4.3			15.3			15.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693	1454		1677	1561	1728	1760	
Flt Permitted		1.00	1.00	0.13	1.00	1.00		0.54	1.00	0.55	1.00	
Satd. Flow (perm)		1756	1492	228	1693	1454		940	1561	996	1760	
Volume (vph)	0	504	341	177	355	36	312	17	219	99	47	13
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	630	426	199	399	40	339	18	238	116	55	15
RTOR Reduction (vph)	0	0	234	0	0	18	0	0	50	0	12	0
Lane Group Flow (vph)	0	630	192	199	399	22	0	357	188	116	58	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	1%	1%	1%
Turn Type			pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases			6	2		2	8		8	4		
Actuated Green, G (s)		24.0	29.7	38.8	38.8	38.8		23.9	32.7	12.2	12.2	
Effective Green, g (s)		26.0	33.7	40.8	40.8	40.8		25.9	36.7	14.2	14.2	
Actuated g/C Ratio		0.35	0.45	0.55	0.55	0.55		0.35	0.49	0.19	0.19	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		611	753	326	925	794		402	851	189	335	
v/s Ratio Prot		c0.36	0.03	c0.09	0.24			c0.09	0.03		0.03	
v/s Ratio Perm			0.10	0.24		0.02		c0.22	0.09	0.12		
v/c Ratio		1.03	0.26	0.61	0.43	0.03		0.89	0.22	0.61	0.17	
Uniform Delay, d1		24.4	12.7	13.9	10.1	7.8		23.0	10.8	27.7	25.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		44.6	0.2	3.4	0.3	0.0		20.4	0.1	5.8	0.2	
Delay (s)		69.0	12.9	17.3	10.4	7.8		43.5	11.0	33.5	25.6	
Level of Service		E	B	B	B	A		D	B	C	C	
Approach Delay (s)		46.4			12.4			30.5			30.5	
Approach LOS		D			B			C			C	

Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3518			1816	1561		1826	1615		1771	1830
Flt Permitted		0.77			0.97	1.00		0.74	1.00		0.75	1.00
Satd. Flow (perm)		2734			1758	1561		1413	1615		1376	1830
Volume (vph)	166	620	36	12	365	16	25	6	11	24	6	178
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	187	697	40	14	429	19	42	10	18	27	7	200
RTOR Reduction (vph)	0	5	0	0	0	7	0	0	15	0	0	162
Lane Group Flow (vph)	0	919	0	0	443	12	0	52	3	0	34	38
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		28.4			28.4	28.4		6.9	6.9		6.9	6.9
Effective Green, g (s)		30.4			30.4	30.4		8.9	8.9		8.9	8.9
Actuated g/C Ratio		0.64			0.64	0.64		0.19	0.19		0.19	0.19
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1757			1130	1003		266	304		259	344
v/s Ratio Prot												
v/s Ratio Perm		c0.34			0.25	0.01		c0.04	0.00		0.02	0.02
v/c Ratio		0.52			0.39	0.01		0.20	0.01		0.13	0.11
Uniform Delay, d1		4.5			4.0	3.0		16.2	15.6		16.0	15.9
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3			0.2	0.0		0.4	0.0		0.2	0.1
Delay (s)		4.8			4.3	3.0		16.5	15.6		16.2	16.1
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.8			4.2			16.3			16.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	47.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	9	9	9	10	10	11	11	11	11
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)		1756	1492	1624	1693	1454		1677	1561	1728	1760	
Flt Permitted		1.00	1.00	0.12	1.00	1.00		0.51	1.00	0.55	1.00	
Satd. Flow (perm)		1756	1492	210	1693	1454		896	1561	996	1760	
Volume (vph)	0	504	341	177	355	36	312	17	219	99	47	13
Peak-hour factor, PHF	0.80	0.80	0.80	0.89	0.89	0.89	0.92	0.92	0.92	0.85	0.85	0.85
Adj. Flow (vph)	0	630	426	199	399	40	339	18	238	116	55	15
RTOR Reduction (vph)	0	0	205	0	0	18	0	0	68	0	13	0
Lane Group Flow (vph)	0	630	221	199	399	22	0	357	170	116	57	0
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	0%	0%	1%	1%	1%
Turn Type			pm+ov	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6	3	5	2		3	8	5		4	
Permitted Phases			6	2		2	8		8	4		
Actuated Green, G (s)		26.6	35.3	39.6	39.6	39.6		24.3	31.3	9.6	9.6	
Effective Green, g (s)		28.6	39.3	41.6	41.6	41.6		26.3	35.3	11.6	11.6	
Actuated g/C Ratio		0.38	0.52	0.55	0.55	0.55		0.35	0.47	0.15	0.15	
Clearance Time (s)		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		662	851	283	928	797		421	808	152	269	
v/s Ratio Prot		c0.36	0.04	c0.08	0.24			c0.12	0.02		0.03	
v/s Ratio Perm			0.11	0.30		0.02		c0.17	0.08	0.12		
v/c Ratio		0.95	0.26	0.70	0.43	0.03		0.85	0.21	0.76	0.21	
Uniform Delay, d1		23.0	10.2	14.2	10.1	7.9		23.0	12.0	30.8	28.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2		23.6	0.2	7.7	0.3	0.0		14.6	0.1	20.0	0.4	
Delay (s)		46.6	10.4	21.9	10.5	7.9		37.6	12.2	50.9	28.6	
Level of Service		D	B	C	B	A		D	B	D	C	
Approach Delay (s)		32.0			13.9			27.4			42.5	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	12	12	12	16
Total Lost time (s)		4.0			4.0	4.0		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95			1.00	1.00		1.00	1.00		1.00	1.00
Frt		0.99			1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected		0.99			1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)		3518			1816	1561		1826	1615		1771	1830
Flt Permitted		0.77			0.97	1.00		0.74	1.00		0.74	1.00
Satd. Flow (perm)		2741			1758	1561		1413	1615		1367	1830
Volume (vph)	166	620	36	12	365	16	25	6	11	24	6	178
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.60	0.60	0.60	0.89	0.89	0.89
Adj. Flow (vph)	187	697	40	14	429	19	42	10	18	27	7	200
RTOR Reduction (vph)	0	6	0	0	0	7	0	0	15	0	0	163
Lane Group Flow (vph)	0	918	0	0	443	12	0	52	3	0	34	37
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	4%	0%	0%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)		28.2			28.2	28.2		6.6	6.6		6.6	6.6
Effective Green, g (s)		30.2			30.2	30.2		8.6	8.6		8.6	8.6
Actuated g/C Ratio		0.65			0.65	0.65		0.18	0.18		0.18	0.18
Clearance Time (s)		6.0			6.0	6.0		6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1769			1134	1007		260	297		251	336
v/s Ratio Prot												
v/s Ratio Perm		c0.33			0.25	0.01		c0.04	0.00		0.02	0.02
v/c Ratio		0.52			0.39	0.01		0.20	0.01		0.14	0.11
Uniform Delay, d1		4.4			3.9	3.0		16.2	15.6		16.0	15.9
Progression Factor		1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3			0.2	0.0		0.4	0.0		0.2	0.1
Delay (s)		4.7			4.2	3.0		16.6	15.6		16.2	16.1
Level of Service		A			A	A		B	B		B	B
Approach Delay (s)		4.7			4.1			16.3			16.1	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	46.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Appendix I – Roundabout Level of Service Analysis

Traffic Impact Study
Ulster Tech City GEIS
Town of Ulster, New York

MOVEMENT SUMMARY

Site: Enterprise Dr/Route 199 EB -
2014 Build - PM Peak (2 lane)

Enterprise Drive/Rt 199 EB Off
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	1535	1.0	0.532	5.7	LOS A	5.0	125.8	0.46	0.49	32.5
8R	R	495	2.0	0.328	5.1	LOS A	1.9	48.7	0.15	0.43	33.0
Approach		2030	1.2	0.532	5.5	LOS A	5.0	125.8	0.38	0.47	32.6
North	Enterprise Drive - SB										
7L	L	43	2.0	0.307	10.0	LOS B	0.0	0.0	0.00	1.05	29.7
4T	T	457	1.0	0.308	4.5	LOS A	0.0	0.0	0.00	0.38	35.3
Approach		500	1.1	0.308	5.0	LOS B	0.0	0.0	0.00	0.44	34.7
West	Route 209 EB Off Ramp - EB										
5L	L	129	2.0	0.161	15.0	LOS B	0.9	23.7	0.54	0.77	28.3
Approach		129	2.0	0.160	15.0	LOS B	0.9	23.7	0.54	0.77	28.3
All Vehicles		2658	1.3	0.532	5.9	LOS A	5.0	125.8	0.32	0.48	32.7

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/Route 199 EB - 2029 Build - PM Peak (2 lane)

Enterprise Drive/Rt 199 EB Off
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	1680	1.0	0.596	5.9	LOS A	6.0	152.3	0.53	0.51	32.1
8R	R	530	2.0	0.350	5.1	LOS A	2.1	53.6	0.16	0.43	32.9
Approach		2210	1.2	0.596	5.7	LOS A	6.0	152.3	0.44	0.49	32.3
North	Enterprise Drive - SB										
7L	L	49	2.0	0.342	10.0	LOS B	0.0	0.0	0.00	1.05	29.7
4T	T	507	1.0	0.342	4.5	LOS A	0.0	0.0	0.00	0.38	35.3
Approach		556	1.1	0.342	5.0	LOS B	0.0	0.0	0.00	0.44	34.7
West	Route 209 EB Off Ramp - EB										
5L	L	150	2.0	0.195	15.5	LOS B	1.2	29.7	0.58	0.79	28.1
Approach		150	2.0	0.195	15.5	LOS B	1.2	29.7	0.58	0.79	28.1
All Vehicles		2915	1.2	0.596	6.1	LOS A	6.0	152.3	0.37	0.50	32.4

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Enterprise Dr/Route 199 WB -
2014 Build - PM Peak (1 lane)

Enterprise Drive/Rt 199 WB
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	671	1.0	0.545	6.0	LOS A	4.6	117.1	0.41	0.50	32.6
8R	R	830	1.0	0.662	6.2	LOS A	6.8	171.6	0.50	0.53	31.3
Approach		1501	1.0	0.662	6.1	LOS A	6.8	171.6	0.46	0.51	31.9
North	Enterprise Drive - SB										
7L	L	135	1.0	0.391	10.2	LOS B	0.0	0.0	0.00	0.97	29.6
4T	T	495	1.0	0.390	4.7	LOS A	0.0	0.0	0.00	0.38	35.1
Approach		630	1.0	0.390	5.9	LOS B	0.0	0.0	0.00	0.51	33.8
West	Route 199 WB Off Ramp - EB										
2R	R	166	0.0	0.227	8.7	LOS A	1.4	35.2	0.62	0.73	26.0
Approach		166	0.0	0.227	8.7	LOS A	1.4	35.2	0.62	0.73	26.0
All Vehicles		2298	0.9	0.662	6.2	LOS A	6.8	171.6	0.34	0.53	31.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/Route 199 WB - 2029 Build - PM Peak (1 lane)

Enterprise Drive/Rt 199 WB
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	744	1.0	0.614	6.3	LOS A	5.7	144.8	0.49	0.53	32.2
8R	R	908	1.0	0.736	6.7	LOS A	8.6	215.9	0.61	0.57	30.8
Approach		1652	1.0	0.736	6.5	LOS A	8.6	215.9	0.55	0.55	31.4
North	Enterprise Drive - SB										
7L	L	158	1.0	0.443	10.2	LOS B	0.0	0.0	0.00	0.97	29.6
4T	T	558	1.0	0.443	4.7	LOS A	0.0	0.0	0.00	0.38	35.1
Approach		715	1.0	0.443	5.9	LOS B	0.0	0.0	0.00	0.51	33.7
West	Route 199 WB Off Ramp - EB										
2R	R	178	0.0	0.260	9.7	LOS A	1.7	41.8	0.67	0.78	25.6
Approach		178	0.0	0.260	9.7	LOS A	1.7	41.8	0.67	0.78	25.6
All Vehicles		2546	0.9	0.736	6.5	LOS A	8.6	215.9	0.41	0.56	31.5

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Enterprise Dr/Middle Drwy - 2014 Build - PM Peak (2 lane)

Enterprise Drive/Rt 209 WB Off/Middle Drwy
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue veh	95% Back of Queue m	Prop. Queued	Effective Stop Rate	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	1595	1.0	0.630	6.2	LOS A	6.4	161.9	0.52	0.53	32.1
8R	R	12	2.0	0.632	7.3	LOS A	6.4	161.9	0.51	0.63	31.2
Approach		1607	1.0	0.629	6.2	LOS A	6.4	161.9	0.52	0.53	32.0
East	Middle Driveway - WB										
1L	L	43	2.0	0.143	17.6	LOS B	0.6	15.8	0.75	0.92	17.7
6R	R	434	2.0	0.787	15.3	LOS B	7.0	177.7	0.90	1.17	17.2
Approach		478	2.0	0.788	15.5	LOS B	7.0	177.7	0.89	1.15	17.3
North	Enterprise Drive - SB										
7L	L	86	2.0	0.345	10.3	LOS B	2.9	72.1	0.21	0.85	29.6
4T	T	371	1.0	0.346	4.8	LOS A	2.9	72.1	0.21	0.38	33.8
Approach		457	1.2	0.346	5.8	LOS B	2.9	72.1	0.21	0.47	32.9
West	Route 209 EB Off Ramp - EB										
5L	L	18	2.0	0.131	16.1	LOS B	0.7	18.2	0.58	0.90	28.3
2T	T	58	0.0	0.131	5.7	LOS A	0.7	18.2	0.58	0.58	26.1
2R	R	458	2.0	0.446	6.5	LOS A	3.4	86.7	0.61	0.64	26.5
Approach		533	1.8	0.446	6.7	LOS B	3.4	86.7	0.61	0.64	26.5
All Vehicles		3074	1.3	0.787	7.7	LOS A	7.0	177.7	0.55	0.64	29.3

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/Middle Drwy - 2029 Build - PM Peak (2 lane)

Enterprise Drive/Rt 209 WB Off/Middle Drwy
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	1784	1.0	0.701	6.4	LOS A	8.1	203.0	0.59	0.55	31.7
8R	R	12	2.0	0.706	7.5	LOS A	8.1	203.0	0.58	0.63	31.1
Approach		1796	1.0	0.701	6.4	LOS A	8.1	203.0	0.59	0.55	31.7
East	Middle Driveway - WB										
1L	L	43	2.0	0.162	18.6	LOS B	0.7	18.6	0.80	0.93	17.2
6R	R	434	2.0	0.903	25.4	LOS C	10.3	262.0	0.96	1.42	13.1
Approach		478	2.0	0.903	24.8	LOS C	10.3	262.0	0.95	1.38	13.4
North	Enterprise Drive - SB										
7L	L	86	2.0	0.380	10.3	LOS B	3.3	83.7	0.22	0.85	29.7
4T	T	421	1.0	0.380	4.9	LOS A	3.3	83.7	0.22	0.38	33.7
Approach		507	1.2	0.381	5.8	LOS B	3.3	83.7	0.22	0.46	33.0
West	Route 209 EB Off Ramp - EB										
5L	L	18	2.0	0.136	16.6	LOS B	0.8	19.2	0.60	0.91	28.0
2T	T	58	0.0	0.136	6.2	LOS A	0.8	19.2	0.60	0.61	25.8
2R	R	520	2.0	0.526	7.6	LOS A	4.7	120.1	0.69	0.75	26.3
Approach		595	1.8	0.526	7.7	LOS B	4.7	120.1	0.68	0.74	26.3
All Vehicles		3375	1.3	0.903	9.1	LOS A	10.3	262.0	0.60	0.69	28.3

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/South Drwy - 2014 Build - PM Peak (2 lane)

Enterprise Drive/South Drwy
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Enterprise Drive - NB										
8T	T	1016	1.0	0.427	5.9	LOS A	3.4	85.0	0.45	0.51	25.1
8R	R	21	0.0	0.422	7.1	LOS A	3.4	85.0	0.44	0.64	22.4
Approach		1037	1.0	0.427	5.9	LOS A	3.4	85.0	0.45	0.51	25.1
East	South Driveway - WB										
1L	L	61	0.0	0.651	17.6	LOS B	4.6	116.1	0.77	1.08	17.6
6T	T	1	0.0	0.588	8.7	LOS A	4.6	116.1	0.77	0.93	16.4
6R	R	318	0.0	0.651	11.1	LOS B	4.6	116.1	0.77	0.98	18.7
Approach		380	0.0	0.651	12.1	LOS B	4.6	116.1	0.77	0.99	18.5
North	Enterprise Drive - SB										
7L	L	117	0.0	0.649	10.8	LOS B	8.3	208.7	0.40	0.81	22.2
4T	T	735	1.0	0.648	5.0	LOS A	8.3	208.7	0.40	0.40	26.4
4R	R	16	0.0	0.651	6.0	LOS A	8.3	208.7	0.40	0.51	24.0
Approach		869	0.8	0.648	5.8	LOS B	8.3	208.7	0.40	0.46	25.7
West	West Campus Drwy - EB										
5L	L	80	3.0	0.258	17.6	LOS B	1.9	47.4	0.81	0.94	17.2
2T	T	2	0.0	0.250	8.8	LOS A	1.9	47.4	0.81	0.82	15.4
2R	R	48	0.0	0.258	11.3	LOS B	1.9	47.4	0.81	0.76	17.9
Approach		130	1.8	0.258	15.2	LOS B	1.9	47.4	0.81	0.87	17.4
All Vehicles		2415	0.8	0.651	7.3	LOS A	8.3	208.7	0.50	0.59	23.5

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/South Drwy - 2029 Build - PM Peak (2 lane)

Enterprise Drive/South Drwy
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows (veh/h)	HV (%)	Deg. Satn (v/c)	Average Delay (sec)	Level of Service	95% Back of Queue Vehicles (veh)	95% Back of Queue Distance (m)	Prop. Queued	Effective Stop Rate (per veh)	Average Speed (km/h)
South	Enterprise Drive - NB										
8T	T	1177	1.0	0.499	6.1	LOS A	4.3	109.5	0.51	0.52	24.6
8R	R	21	0.0	0.505	7.3	LOS A	4.3	109.5	0.51	0.66	22.2
Approach		1198	1.0	0.499	6.1	LOS A	4.3	109.5	0.51	0.53	24.6
East	South Driveway - WB										
1L	L	61	0.0	0.728	20.0	LOS C	5.7	141.3	0.84	1.14	16.4
6T	T	1	0.0	0.588	11.2	LOS B	5.7	141.3	0.84	1.04	14.7
6R	R	318	0.0	0.727	13.6	LOS B	5.7	141.3	0.84	1.07	17.0
Approach		380	0.0	0.728	14.6	LOS C	5.7	141.3	0.84	1.08	16.9
North	Enterprise Drive - SB										
7L	L	117	0.0	0.816	11.1	LOS B	15.9	399.1	0.62	0.69	22.4
4T	T	976	1.0	0.815	5.4	LOS A	15.9	399.1	0.62	0.43	24.6
4R	R	17	0.0	0.831	6.4	LOS A	15.9	399.1	0.62	0.49	23.0
Approach		1110	0.9	0.815	6.0	LOS B	15.9	399.1	0.62	0.46	24.3
West	West Campus Drwy - EB										
5L	L	92	3.0	0.462	27.8	LOS C	4.2	106.4	0.97	1.09	13.3
2T	T	2	0.0	0.500	19.0	LOS B	4.2	106.4	0.97	1.07	10.4
2R	R	56	0.0	0.463	21.5	LOS C	4.2	106.4	0.97	0.98	12.8
Approach		150	1.8	0.462	25.3	LOS C	4.2	106.4	0.97	1.05	13.1
All Vehicles		2838	0.9	0.831	8.2	LOS A	15.9	399.1	0.62	0.60	22.2

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Enterprise Dr/Boices Lane - 2014 Build - PM Peak (1 lane)

Enterprise Drive/Boices Lane
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Mountain View Court - NB										
3L	L	1	0.0	0.015	18.8	LOS B	0.1	2.1	0.76	0.85	19.1
8T	T	1	0.0	0.015	11.2	LOS B	0.1	2.1	0.76	0.70	20.7
8R	R	3	0.0	0.015	12.4	LOS B	0.1	2.1	0.76	0.63	20.4
Approach		5	0.0	0.015	13.7	LOS B	0.1	2.1	0.76	0.70	20.1
East	Boices Lane - WB										
1L	L	1	0.0	0.098	12.3	LOS B	0.6	15.5	0.53	0.92	27.6
6T	T	75	3.0	0.095	6.5	LOS A	0.6	15.5	0.53	0.57	30.7
6R	R	751	1.0	0.468	5.8	NA[9]	NA[9]	NA[9]	0.00	0.47	32.9
Approach		827	1.2	0.468	5.9	LOS B	0.6	15.5	0.05	0.48	32.7
North	Enterprise Drive - SB										
7L	L	756	1.0	0.604	12.7	LOS B	6.6	166.5	0.40	0.63	20.9
4T	T	4	0.0	0.628	4.1	LOS A	6.6	166.5	0.40	0.34	21.5
4R	R	18	0.0	0.606	6.2	LOS A	6.6	166.5	0.40	0.45	23.7
Approach		778	1.0	0.604	12.5	LOS B	6.6	166.5	0.40	0.62	21.0
West	Boices Lane - EB										
5L	L	376	0.0	0.483	18.3	LOS B	4.6	115.8	0.84	0.96	23.1
2T	T	344	0.0	0.501	12.0	LOS B	4.8	119.1	0.85	0.96	26.0
2R	R	2	0.0	0.463	14.7	LOS B	4.8	119.1	0.85	1.00	25.3
Approach		722	0.0	0.501	15.3	LOS B	4.8	119.1	0.84	0.96	24.3
All Vehicles		2332	0.7	0.628	11.0	LOS B	6.6	166.5	0.41	0.68	26.3

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

9 Continuous movement

MOVEMENT SUMMARY

Site: Enterprise Dr/Boices Lane - 2029 Build - PM Peak (1 lane)

Enterprise Drive/Boices Lane
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows (veh/h)	HV (%)	Deg. Satn (v/c)	Average Delay (sec)	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance (m)	Prop. Queued	Effective Stop Rate (per veh)	Average Speed (km/h)
South	Mountain View Court - NB										
3L	L	1	0.0	0.020	23.1	LOS C	0.1	3.0	0.83	0.88	17.4
8T	T	1	0.0	0.020	15.5	LOS B	0.1	3.0	0.83	0.77	18.2
8R	R	3	0.0	0.020	16.7	LOS B	0.1	3.0	0.83	0.66	18.0
Approach		5	0.0	0.020	18.0	LOS C	0.1	3.0	0.83	0.74	17.9
East	Boices Lane - WB										
1L	L	1	0.0	0.119	12.7	LOS B	0.8	20.7	0.60	0.92	27.5
6T	T	88	3.0	0.120	7.0	LOS A	0.8	20.7	0.60	0.61	30.3
6R	R	866	1.0	0.540	5.8	NA[9]	NA[9]	NA[9]	0.00	0.47	32.9
Approach		955	1.2	0.540	6.0	LOS B	0.8	20.7	0.06	0.49	32.6
North	Enterprise Drive - SB										
7L	L	857	1.0	0.696	13.0	LOS B	9.0	226.4	0.52	0.62	20.6
4T	T	5	0.0	0.687	4.4	LOS A	9.0	226.4	0.52	0.39	20.1
4R	R	20	0.0	0.706	6.4	LOS A	9.0	226.4	0.52	0.47	22.7
Approach		882	1.0	0.696	12.8	LOS B	9.0	226.4	0.52	0.62	20.6
West	Boices Lane - EB										
5L	L	437	0.0	0.650	23.8	LOS C	8.3	207.2	0.98	1.14	20.5
2T	T	400	0.0	0.685	18.8	LOS B	8.6	215.3	0.98	1.16	21.7
2R	R	2	0.0	0.617	21.5	LOS C	8.6	215.3	0.98	1.17	21.4
Approach		839	0.0	0.684	21.4	LOS C	8.6	215.3	0.98	1.15	21.0
All Vehicles		2681	0.7	0.706	13.1	LOS B	9.0	226.4	0.50	0.74	24.7

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

9 Continuous movement

MOVEMENT SUMMARY

Site: Boices Lane/Middle Drwy/
Dalewood St - 2014 Build - PM Peak
(1 lane)

Boices Lane/Middle Driveway/Dalewood Street
Build 2014 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Aver. Speed km/h
South	Dalewood Street - NB										
3L	L	7	0.0	0.043	19.4	LOS B	0.3	8.1	0.87	0.84	17.1
8T	T	1	0.0	0.044	10.7	LOS B	0.3	8.1	0.87	0.75	15.7
8R	R	7	0.0	0.043	13.2	LOS B	0.3	8.1	0.87	0.67	17.9
Approach		15	0.0	0.043	15.9	LOS B	0.3	8.1	0.87	0.75	17.4
East	Boices lane - WB										
1L	L	11	0.0	0.566	10.5	LOS B	5.9	148.7	0.23	0.91	26.1
6T	T	727	1.0	0.552	5.1	LOS A	5.9	148.7	0.23	0.40	30.9
6R	R	41	0.0	0.552	6.1	LOS A	5.9	148.7	0.23	0.54	28.8
Approach		778	0.9	0.552	5.3	LOS B	5.9	148.7	0.23	0.41	30.7
North	Middle Driveway - SB										
7L	L	120	0.0	0.241	15.7	LOS B	1.6	40.5	0.71	0.88	18.7
4T	T	1	1.0	0.235	7.0	LOS A	1.6	40.5	0.71	0.71	18.3
4R	R	31	0.0	0.241	8.3	LOS A	1.6	40.5	0.71	0.69	18.0
Approach		152	0.0	0.241	14.1	LOS B	1.6	40.5	0.71	0.84	18.6
West	Boices Lane - EB										
5L	L	26	0.0	0.799	12.3	LOS B	12.8	322.5	0.77	0.74	28.0
2T	T	914	1.0	0.806	6.9	LOS A	12.8	322.5	0.77	0.58	29.2
2R	R	11	0.0	0.785	7.9	LOS A	12.8	322.5	0.77	0.60	28.7
Approach		952	1.0	0.806	7.1	LOS B	12.8	322.5	0.77	0.59	29.1
All Vehicles		1897	0.9	0.806	7.0	LOS A	12.8	322.5	0.55	0.54	28.8

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Boices Lane/Middle Drwy/
Dalewood St - 2029 Build - PM Peak
(1 lane)

Boices Lane/Middle Driveway/Dalewood Street
Build 2029 - PM Peak Hour
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South	Dalewood Street - NB										
3L	L	7	0.0	0.062	23.3	LOS C	0.5	12.5	0.95	0.88	15.5
8T	T	1	0.0	0.062	14.6	LOS B	0.5	12.5	0.95	0.85	13.6
8R	R	7	0.0	0.062	17.2	LOS B	0.5	12.5	0.95	0.71	15.8
Approach		15	0.0	0.062	19.8	LOS C	0.5	12.5	0.95	0.80	15.5
East	Boices lane - WB										
1L	L	11	0.0	0.633	10.6	LOS B	7.9	199.3	0.28	0.88	26.1
6T	T	833	1.0	0.623	5.2	LOS A	7.9	199.3	0.28	0.40	30.6
6R	R	41	0.0	0.619	6.1	LOS A	7.9	199.3	0.28	0.53	28.7
Approach		885	0.9	0.623	5.3	LOS B	7.9	199.3	0.28	0.41	30.4
North	Middle Driveway - SB										
7L	L	120	0.0	0.271	17.1	LOS B	1.9	47.8	0.77	0.92	18.0
4T	T	1	1.0	0.294	8.4	LOS A	1.9	47.8	0.77	0.79	17.1
4R	R	31	0.0	0.271	9.7	LOS A	1.9	47.8	0.77	0.74	16.9
Approach		152	0.0	0.271	15.5	LOS B	1.9	47.8	0.77	0.88	17.8
West	Boices Lane - EB										
5L	L	26	0.0	0.909	14.9	LOS B	22.4	564.3	1.00	0.69	26.6
2T	T	1042	1.0	0.907	9.6	LOS A	22.4	564.3	1.00	0.69	28.0
2R	R	11	0.0	0.916	10.5	LOS B	22.4	564.3	1.00	0.66	28.0
Approach		1079	1.0	0.907	9.7	LOS B	22.4	564.3	1.00	0.69	28.0
All Vehicles		2131	0.9	0.916	8.4	LOS A	22.4	564.3	0.68	0.59	28.0

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.